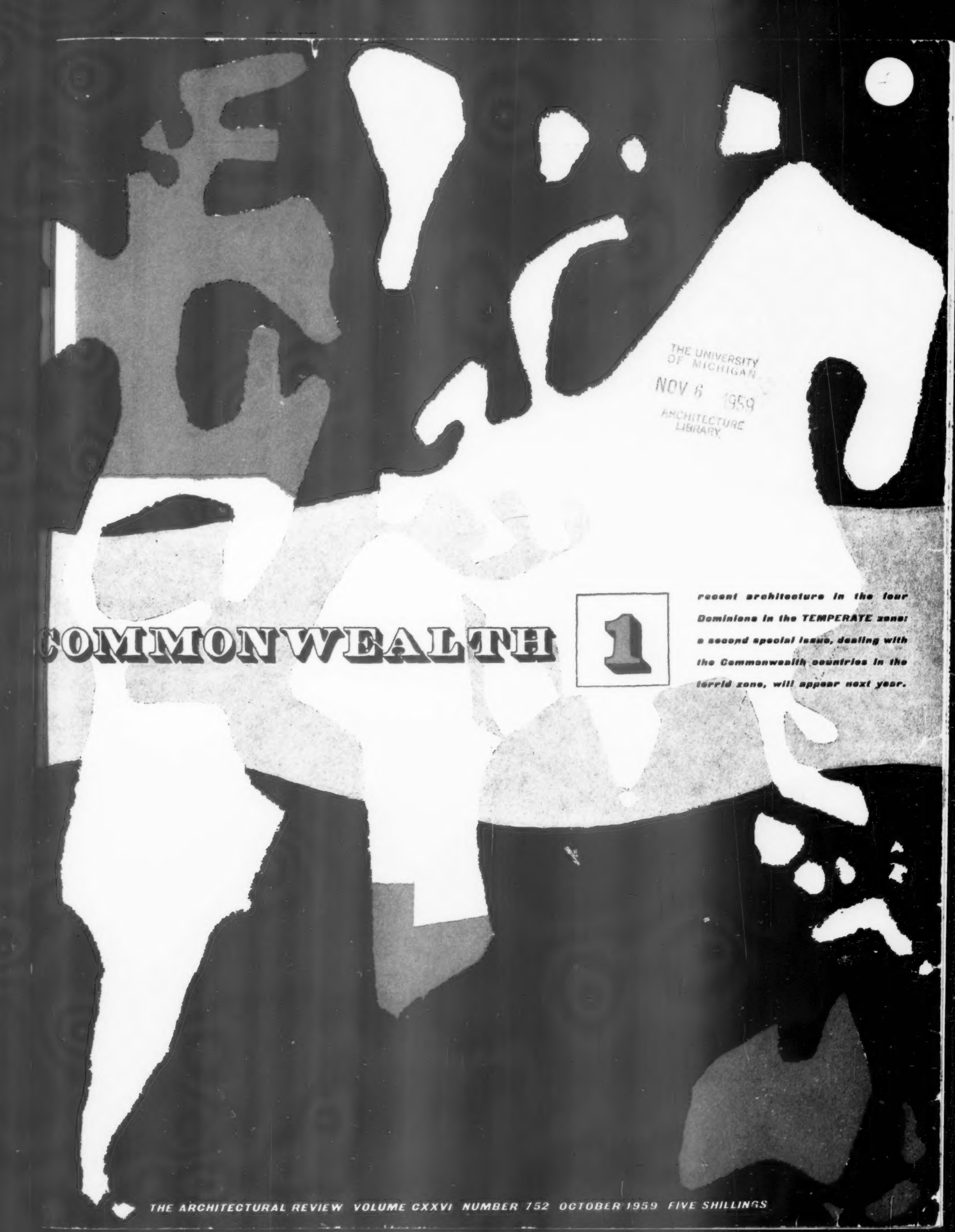


COMMONWEALTH 1

recent architecture in the four Dominions in the TEMPERATE zone: a second special issue, dealing with the Commonwealth countries in the torrid zone, will appear next year.

THE ARCHITECTURAL REVIEW VOLUME CXXVI NUMBER 752 OCTOBER 1959 FIVE SHILLINGS

MARGINALIA

BOOK REVIEWS

The Classical Ideal

THE IDEAL CITY IN ITS ARCHITECTURAL EVOLUTION. *By Helen Rosenau. Routledge & Kegan Paul* 1959. 30*s*.

The Ideal City can mean two things: a plan on paper as to what, not *a* city, but *the* city, should be, or an existing city which one calls ideal—'Siena or Harlow or Cambridge to me is almost an ideal city'—because of size, situation, visual qualities or for other reasons. Occasionally *the* ideal city was built, and then it may become *an* ideal city or it may not.

Dr. Rosenau's programme is expressed in a sentence on one of her last pages: 'It is a common experience that in order to reach the possible the impossible has to be attempted, or to put it in other words, a society lives on hope.' That is a fine programme, but Dr. Rosenau does not fulfil it, being drawn away all the time by ideas, allusions and asides. Why, for instance, should the pages dealing with Georgian England discuss Soane's style, Telford, Pugin, Wyatville and designs for cottages by Gandy and Plaw? Or why the (admittedly specially interesting) pages on Quatremère de Quincy? Bath is duly given a page, though without the crucial observation that it is the first planned town on the principles of asymmetry and informality.

Up to the eighteenth century Dr. Rosenau concentrates (except where she digresses) on symmetrical and formal plans, and she runs through Greece and Rome, stresses very convincingly the medieval monastery and the images of the Heavenly Jerusalem, and goes on to bastides, to Alberti and Filarete and so to Mannerism and the radial towns actually built. Our old friend Palmanova duly appears, but not the earlier Zamosc and Philippeville. Leonardo da Vinci's brilliant *aperçu* of two-level communication is illustrated, though it is neither part of an ideal town nor of consistent urbanistic considerations.

So far there is a scheme which one can follow. With the Baroque the scheme is lost sight of for whole pages. Wren's plan for London is hardly mentioned, but Fischer von Erlach gets half a page; of Piranesi's records and visions it is said that to him 'ancient Rome was truly an ideal city'—*a* city, it will be noticed, not *the* city—and Poussin is called 'truly a planner,' since 'for him the ideal town was part of the ideal landscape.' That can do no good to anybody.

Dr. Rosenau comes into her own, of course, with Boullée and Ledoux, though Boullée after all did not design an ideal city. In the chapter dealing with them and their influence in Germany and England it becomes increasingly patent that she is a Classicist and a Grand Mannerist herself. 'Neo-Classical Art,' she says, 'is slowly coming into its own again.'

Hence, when it comes to the nineteenth and twentieth centuries, she has no illustration of Howard's ideal garden city which ought to have had at least as much prominence as Chaux's, for Howard, in spite of the schematicism of his city on paper, said: 'Plans cannot be drawn until site selected.' Dr. Rosenau has also not a word on Letchworth and Welwyn and Radburn, which is unpardonable, and she is out of sympathy with Frank Lloyd Wright's Broadacres. There is no plan of Garnier's informal *Cité Industrielle*, and only a scathing reference to Sant' Elia's elements of a metropolis. Le Corbusier on the other hand is appreciated, because he 'still reflects the classical tradition.'

The situation today Dr. Rosenau sees in terms of 'two contrasting elements, the garden city and the mechanized town.' Her programme is not precise, as indeed precision in formulating is not her forte. She is against urban spread; she is for enclosure, for the redeeming of city centres—hence Rotterdam is illustrated and gets good marks—for the mixing of classes and the mixing of housing with smokeless factories, and she pleads in an illuminating paragraph for symmetry as 'a basic human urge.' The cross of axes at Brasilia appeals to her. Other aspects of Brasilia are neglected, and neither Canberra nor New Delhi appear. Chandigarh is given a bare line, and the English New Towns and Vällingby get not a word, nor does Ina Casa.

In short Dr. Rosenau's book is strongly idiosyncratic. It is full of suggestive and tantalizing pieces of information and hints at ideas beyond town-planning, but it lacks both direction and consistency.

Nikolaus Pevsner

Islam Built

TURKISH ISLAMIC ARCHITECTURE, SELJUK TO OTTOMAN. *By Behcet Unsal; Tiranti.* 30*s*.

The Turks were great builders, and with their limited vocabulary of structural form achieved a very high degree of perfection. This, coupled with a longstanding tradition of decorative ability, produced buildings in which structure and decoration combine to create vast spaces whose massive elements glow with a mystic radiance. Form rarely follows function; rather a variety of functions find their place simply and easily within a continuity of form. (One might easily mistake the plan and section of a mosque for a Turkish bath or royal pavilion). It is our loss that our authors and publishers have tended to neglect this great tradition, and here, when a book comes to be written and published, it is disappointing to find it dull and academic with woolly old-fashioned illustrations of magnificent buildings that are highly photogenic.

This is a book by an ardent Turkish nationalist (as all modern Turks are), and therefore tends to isolate the Turkish contribution from the influence and inspiration of its neighbours. It would be foolish to deny Turkey its true national characteristics, and the regional conditions and local genius that came to determine the architectural form and character that is peculiarly Turkish. But the great wealth of ideas that flowed into the country are too coolly acknowledged in this book to give a clear picture of Turkey's place in the architecture of Islam.

For the traveller to Turkey this book will be very useful because many buildings are documented and brief (too brief) descriptions given, but for someone who reads it in order to become familiar with a great architecture unknown to him, it dwells in far too little detail on far too many buildings so that the overall picture is hard to follow.

There are numbered references in the margins to plans and photographs so that as you read the line of thought is continually interrupted while you thumb your way through the relevant notes, captions, pictures and plans in an attempt to grasp a reasonably total picture of a building. The plans are simply black and white silhouettes so that the uninitiated might easily confuse a building with its adjacent courtyard. This is a shame because many plans are shown and, were the functional relationships indicated, would be useful indeed.

There is nevertheless much information to be gleaned from the book. In Islam, we learn, schools and hospitals were constructed as part of the complex of religious buildings and at a time when mental disease was wholly misunderstood in Europe, '. . . the sounds of the fountain blended with the sounds of music to assist the cure of mental disorders.'

John Donat

Provincial Powers

SMALL TOWN POLITICS. *By A. H. Birch. Oxford University Press.* 25*s*.

Having read this book I have come to the conclusion that I am even less interested in politics than the people of Glossop. This is perhaps to be expected if Glossop is representative of the provinces from whence I came, where local government—I have always thought—should be conducted on non-party-political lines.

I imagine interest would only arise if the book had related local politics to the outward form of the town, e.g. does better townscape or architecture or environment result from small towns than from big cities; does aristocratic government produce these more easily than democracy—or technocracy; is Glossop less subsubtopian than other places (what *is* Glossop like to look at?).

In this respect the book is useful in starting such a train of thought but conclusions will depend on where the thoughts lead. Will, for instance, the new financial arrangements with local authorities reduce subtopia; did good townscape die out with the old ruling classes; is universal suburbia inevitable with present day local government; should national administration be encouraged rather than regretted; is this latter the only way that brilliant provincial minds can be redirected for the benefit of the provinces?

Raymond Spurrier

Triennale 1960

With the reassuring reliability of Greek messengers announcing the recurrence of a great festival, the programme of the next *Triennale di Milano* has just appeared. This one, the twelfth in the series, which will be held in the Parco Sempione from July to November, 1960, will have as its theme the Home and the School, 'considered as the basis of every organized society . . . the two hinges on which all other political, social, cultural and economic issues must turn if they are to find a pondered solution.' Other sections of the exhibition will 'compare glass and steel production' at both craft and industrial levels, will deal with the history of plates and cutlery, and include personal exhibits of the work of individual architects. There will also be temporary exhibitions within the frame of the main programme, and competitions concerned with school design, of which details will be announced later.

English readers will hardly fail to notice that the main theme of *Triennale* 12 is one that strongly favours a major British exhibit at an official level, in view of our post-war record in both fields, and the news that once again, in 1960, there is to be no official British participation, in spite of efforts by the COID to persuade the Board of Trade and the Treasury to show some initiative, is therefore more than a matter of regret in progressive design circles; it is an insult to a devoted body of men whose labours have contributed to one of Britiain's greatest achievements in design and social progress.

Greek meets Goth

In his study of Alexander 'Greek' Thomson (AR, May, 1954), Graham Law mentioned, but did not quote, Thomson's attack on Gilbert Scott's design for Glasgow University's new buildings, the Gothic heart of the present University complex. It now appears, however, that a complete text of the lecture given by Thomson in May, 1866, was published at the very same time in the Glasgow University *College Courant*,* reconstituted from the cut version that was published in 1867, and from Thomson's manuscript notes. The text proves to be one of the loudest, as well as one of the last, shots exchanged in the Battle of the Styles.

Thomson's argument has three main heads: the first, dealt with quickly and damagingly in the introductory remarks, is that 'the Professors' had done the University a disservice by going to a man as busy as Scott, who would never have the time to work on the scheme personally, and had obviously handed it down to a less accomplished assistant. With this out of the way, he proceeds to the main heads on which he speaks at length—the failings of the Gothic style in general, and the failings of the Scott design in particular.

On Gothic in general, he speaks with his own Attic prejudices, but often in terms that suggest the structural rationalism of the latter end of the century. It is the style of European civilization at a low ebb, unlike the Greek, which is the style of one of its high points. Alternatively, it is the style of unreformed Christianity (and therefore a poor compliment to the Scots!). Then he settles down to the structural and aesthetic failings of Gothic. On the former point he observes that all Gothic architecture depends on vaulted construction which is inherently unstable—'There can be no doubt that the introduction of the arch into architecture has strewed Europe with ruins'—and must therefore be braced. But the buttresses with which this bracing is achieved are inefficient and wasteful and 'an enormous cost of material; for a modern engineer would for the same purpose make a pound of wire go as far as a ton of stone.'

On the aesthetic side his arguments

* 1954 Vol. VI, Nos. 12 and 13.

are the familiar ones that Gothic, being picturesque, lacks 'the ideal quality' and he argues, in the next paragraphs in a manner that anticipates Le Corbusier 'the fact is, that the laws that govern the universe . . . are the same which govern architecture. We do not contrive rules; we discover laws. There is such a thing as architectural truth. One man may make an endeavour to embody an idea in form . . . and so on from generation to generation, until, purged of every particle of useless material, and adjusted in all its portions, it becomes for all time a typical form . . .' This makes Gothic architecture, by contrast, resemble the lower forms of life, and the argument proceeds by detail contrasts of Greek and Gothic solutions to similar architectural problems, illuminated by *obiter dicta* such as: 'Small Gothic buildings are not impressive unless begrimed with dirt'.

From this ground, Scott is an easy target whom he faults successfully right from the start, for having applied the irregularities of Gothic to a symmetrically planned building. Aesthetically, Thomson shows this to be a mistake, because Scott does not know how to compose a symmetrical façade; functionally a mistake because it does not allow the exploitation of the much-vaunted 'flexibility' of Gothic planning. There is a good deal in this strain, but Thomson's most telling stroke is on the subject of the actual style of the detailing, which Scott claimed 'succeeded in recovering what was the early architecture of Scotland.' To which Thomson justifiably retorts 'Granting that it is both interesting and useful to know what style of architecture prevailed in Scotland at a particular period, he has merely taken a most expensive mode of illustrating his archaeological discoveries, by building in stone and lime, at a cost of two or three thousand pounds, what might have sufficiently well been done by a series of woodcuts for a very small sum.'

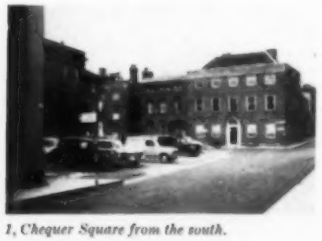
CORRESPONDENCE

Bury St. Edmunds

To the Editors,

SIRS,—It was a pity that in his admirable note on Bury St. Edmunds Mr. Nairn passed so quickly over one of the most alarming of the proposals—the threatened demolition of the north side of Chequer Square to open up the view in front of the Bell Tower.

The demolition would mean (*a*) the loss of one of the best Georgian town houses in the country; (*b*) the destruction of a charming domestic enclave, 1; (*c*) the wrecking of the rhythm of buildings as one moves northwards along Crown Street past the two churches—at present one of the happiest architectural features of the city; (*d*) perhaps worst of all the disruption of the visual unity and physical closeness of church and town, which is as essential to us now as to the designers of a great medieval plan like that of Bury, and which is beautifully preserved in the relation between Chequer Square and the Bell Tower, 2.



1, Chequer Square from the south.

2, the Bell Tower seen across Chequer Square.

All this would be lost in order to provide an axial approach to the church, which, *pace* the architect, was never a prominent medieval motif, and which—as my third photograph, 3, shows—is in any case

3, the Bell Tower on the axis of Churchgate Street.

substantially realized by the view along Churchgate Street.

Mr. Dykes Bower supports his proposals for Chequer Square by arguing that a dangerous traffic junction would be improved. But at the moment the corner of Chequer Square and Crown Street is such that any motorist can't help seeing that he must take care: an *easier* corner would almost certainly be a more dangerous one.

This is not any Georgian bit of any English town. Bury St. Edmunds is probably the finest town of its size in the country; and the surroundings of the cathedral one of its most precious and beautiful parts.

Yours, etc.,
ANDOR GOMME.

Cambridge.

High Pavements

To the Editors,

SIRS,—I would like to suggest an idea to you.

One possible way of overcoming the problem of motor vehicle parking in built-up areas would be to elevate the pavement. The space under the 'walkover' could be used for parking by motor vehicles, thus leaving the carriageway clear, at least for two-way traffic.

I envisage the walkover at normal first floor level—many problems for shopkeepers and others would arise—none, I suggest, insuperable.

Pedestrians could go up to and come down from the walkover at stairways, beside which there could be simple lifts (like those in use on buildings sites) for prams and bath chairs.

I wonder if you would do me the favour of letting me know what you think of this suggestion? Does it sound to be too cranky to be considered seriously?

Yours, etc.,
G. E. TWELLS.

91 Belgrave Road,
S.W.1.

Raymond Spurrier (author of the article, 'Caution—Road Works,' in the April, 1959, AR) replies.

Mr. Twells asks a simple question and the simple answer is: No, it is not too cranky to be considered seriously. In fact it has been. C. D. Buchanan explored the idea at some length in 'Mixed Blessing.'

The idea of vertical separation is not new; there is historical precedent in the Rows of Chester and the high pavements of Bath and Bristol and a number of other places. In Royal York Crescent, Clifton, I believe there were coachhouses under the pavement.

But Buchanan's main purpose was to resolve the pedestrian-vehicular conflict whereas Mr. Twells suggests it as a (no doubt partial) solution to the parking problem.

This raises the whole philosophy of the use of motors in towns. Increased parking facilities—or for that matter wider carriageways—do not necessarily relieve traffic congestion; in the long run they probably increase it and put more pressure on parking space.

A parking survey of 6¾ sq. miles of inner London (including Pimlico and Belgravia) showed 6,300 vehicles parked/square mile in 1955. It has been suggested that improved roads might raise the demand to 18,000/sq. mile. So to oversimplify with rough and ready arithmetic:

say 16 ft. length required to park and manoeuvre = about 270 cars/mile run
× 2 = 540 cars/mile run using both sides
Deduct at least ⅓ for bus stops, side streets, private entrances, etc. = 360 cars/mile run

$$\frac{18{,}000}{360} = \text{50 miles of convertible main roads with business frontage required in 1 sq. mile of central London.}$$

If you could find this and convert, it might meet the average demand. But Central Area demand is how many times greater than Pimlico?

Multiply by this amount, 5? 50? (Hyde Park Corner to Piccadilly Circus is approximately ¾ mile).

All this presupposes longitudinal parking, i.e. parallel to the traffic stream—wasteful of space when you consider what it would cost to lift the pavement. Parking at 90° or 60° to the kerb might double capacity, but traffic would be seriously disrupted every time anyone wanted to unpark.

Structural columns would get in the way. Cantilevering would mean major amendments to existing buildings. Equitably, every building owner would expect vehicular access to his own ground floor, further disrupting traffic flow (and losing parking space) though this might be offset by off-street loading, and occasional private parking space (2s. 6d. an hour?)

So a rough summary might be: expensive and doubtful as a car parking measure; a good idea for pedestrians, if it were carried out on a comprehensive and large enough scale.

INTELLIGENCE

The Prize of the Sao Paulo Prefecture, the major award at the Sao Paulo international biennial exhibition of modern art, has been won by Miss Barbara Hepworth, the British sculptor. This is the first time that the prize has been won by a British artist.

The seventh congress of the International Federation of Landscape Architects will be held in Amsterdam on June 20, 21 and 22, 1960. Speakers will include Professor Lewis Mumford, of the U.S.A.; Professor Cabral, of Portugal; Mrs. Gollwitzer, of Germany; Professor Tono, of Japan; Professor Glikson, of Israel; and Jhr. Sandberg, of Holland.

An award worth $10,000 is to be made each year to a person or group who has helped the development or appreciation of visual design in the useful arts. It is to be known as the Kaufmann International Design Award and will be given by the Edgar J. Kaufmann Educational and Charitable Foundation of Pittsburgh.

A competition for new designs for the Roman Catholic Cathedral at Liverpool has been announced. Details may be obtained from the Competition Secretary, Liverpool Metropolitan Cathedral Committee, 152 Brownlow Hill, Liverpool 3, before December 15, 1959, on payment of a deposit of 2 guineas. The closing date is August 3, 1960.

ACKNOWLEDGMENTS

MARGINALIA, pages 145–146: 1–3, Andor Gomme. Frontispiece, page 148: Photographic Survey Corporation. CANADA INTRODUCTION, pages 153–156: 1, National Film Board; 2, Arnott and Rogers; 3, Canadian Pacific Railway. CANADIAN BUILDINGS, pages 157–172: 1, Thompson, Berwick and Pratt; 2, 3, 18, 20–22, 24, 31, 32, 34–38, 40, 41, 43, 44, 45, Max Fleet; 4, 7, 12–17, 19, 30, 33, 48–50, Panda; 5, Alberta Government Photograph; 6, Photographic Survey Corporation; 8, 25, 29, Svarre Cantlon; 9, 10, Wells Studio; 11, Brian Shawcroft; 23, Studio Alain Enrg.; 28, Belair; 39, E. W. Cadman; 46, 47, Leonard Frank Photographers. SOUTH AFRICA INTRODUCTION, pages 173–176: 1, 3–6, Director of Information, South Africa House; 2, Aircraft Operating Co.; 7, Satour. SOUTH AFRICAN BUILDINGS, pages 177–188: 1–3, Samuel Haskins; 4–6, 34, E. Robinow; 7, Monte Bryer; 8, 9, 16–23, Studio Wesslo; 10–15, 25, 26, 30, Alan Yates; 24, 32, 37, J. G. Boss; 28, James White and Partners; 29, W. W. Wood and Partners; 31, Herman J. Hahndiek; 33, Dolman Pretorius; 35, S. H. Wellman; 36, University of the Witwatersrand. AUSTRALIA INTRODUCTION, pages 189–192: 1, 3, 5, Australian National Travel Association; 2, Australian News and Information Bureau. AUSTRALIAN BUILDINGS, pages 193–202: 1–3, 15, 23–25, 29, 30, Max Dupain and Kerry Dundas; 5, 17, 18, 19, Wolfgang Stevers; 6, 26, Australian News and Information Bureau; 7, Douglass Baglin; 8, D. Darian Smith; 13, Corke and Clabburn; 14, Herald Sun Photograph; 16, Risco and Kos; 20, Ronald H. Armstrong; 28, Gordon F. De'Lisle. NEW ZEALAND INTRODUCTION, pages 203–206: 1, 2, National Publicity Studios; 3, Barry McKay; 4, National Publicity Studios; 5, High Commissioner of New Zealand. NEW ZEALAND BUILDINGS, pages 207–217: 1, 17, Sparrow Industrial Pictures; 3, 4, R. A. Ayton; 5, R. V. Francis Smith; 6, Bruce Watt Studio; 7–9, M. D. King; 12, 22, 23, Martin Barriball; 18, 20, G. H. Burt; 27, Hi-Light Studios; 29–31, Mannering and Donaldson.

Illustration 4 on page 191 anticipates an article on Nineteenth Century Ironwork in Australia by E. G. Robertson which is to be published in the REVIEW shortly.

THE ARCHITECTURAL REVIEW

COMMONWEALTH I: SPECIAL ISSUE

Volume 126 Number 752 October 1959

On this month's cover, the familiar "Red on the Map" identifies the four Dominions whose recent architecture is discussed and illustrated in this issue—Canada, the Union of South Africa, Australia and New Zealand. All four share a more-or-less temperate climate, and their architectures therefore present certain general features in common. These are not shared with the architecture of the Commonwealth countries of the tropics, which will be the subject of another special issue next year.

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THE ARCHITECTURAL REVIEW
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The Editors are indebted to Mr. Walter Manthorpe in Canada, Mr. Duncan Howie in South Africa, Mr. Robin Boyd in Australia and Mr. Lewis Martin in New Zealand for invaluable help in collecting the material for this issue, as well as to all the architects who provided illustrations of their buildings.

This, the first of two special issues on the British Commonwealth, deals with the most recent architecture in Canada, South Africa, Australia and New Zealand. These four Dominions are still widely thought of as consisting of wide open spaces on which the works of man are only beginning to make a substantial impression. This remains to some extent true, but they also now contain thriving and dynamic cities, providing opportunities for architecture as stimulating as any in the world. The picture above is of Toronto, Canada (looking away from the lake-shore, up University Avenue), but it might equally well, in the impression it gives of activity, growth and change, be Johannesburg, Melbourne, Wellington, Montreal, Sydney or Vancouver.

Nikolaus Pevsner

COMMONWEALTH I

It is patently impossible to present recent architectural developments in the Commonwealth between the covers of one issue of THE ARCHITECTURAL REVIEW. The material will therefore be divided in two, this number treating the Dominions with temperate climes, a later number the Dominions and Colonies in the tropics and sub-tropics. The four dominions which will appear in the following pages are Canada, Australia, New Zealand and South Africa. Even their temperate climes have to be taken with some latitude. Their territories include the icy wastes of Labrador, the parched steppes of the Karroo, and the desert of the Australian north from which miraculously rises Mt. Isa with the ant-like business of its miners. Their human population includes Eskimos and Bantu, their animal population the polar bears and the white whales of the Hudson's Bay and the hippos and giraffes of the Kruger National Park. However, where modern architecture goes up, climatic conditions are no different from those of Europe and the United States. That leaves still enough variety, and it is indeed the differences of climate between the four dominions, and the corresponding differences in historical growth, in the resulting ethnological situation and in social circumstances, which must be appreciated in order to understand why architecture in Canada, Australia, New Zealand, South Africa is what it is.

Sizes first: The United Kingdom is 93,000 sq. miles in size, New Zealand 104,000, South Africa, 472,000, Australia nearly three million, Canada nearly four—that is more than the United States. Usable space, however, reduces these figures to a fraction, in all cases but that of New Zealand.

Population second: Canada has 16 million inhabitants, South Africa 12½, Australia 9, New Zealand less than 2¼. These populations are mixed, between aboriginal inhabitants and immigrants. In Australia there are no more than 50,000 aborigines, in Canada no more than 166,000 Red Indians and Eskimos, in New Zealand 137,000 Maoris, but in South Africa the Native, Asian and coloured population is over 12 million, the white population not much more than 2½. Only the Maoris are fully integrated, but even they play no part in the designing of buildings. The white population of Canada then is greater than that of the other three dominions put together.

Modern building goes on chiefly in cities. If we take cities of over 300,000, over a third of the population of Canada lives in such cities, half the population of Australia and over

a third of the white population of South Africa (that includes Pretoria with 275,000 white inhabitants). New Zealand has only one city larger than 300,000 (Auckland), and we must go down to 150,000 to arrive at a ratio of town to country and country town dwellers similar to that of the other dominions.

Finally cities. Sydney, Melbourne and Montreal have more than a million inhabitants, Toronto comes next with 660,000. The others are below half a million, including Johannesburg, if one considers its white population only. This is 360,000; the total is 885,000. Similar proportions apply to Cape Town and Durban. Sydney is about the size of Detroit, Montreal of Glasgow, Toronto of Cologne, white Johannesburg of Florence. If the latter two to the European eye appear far bigger, that is due to architecture.

The Commonwealth is the most improbable federation. It is welded together by imponderables and yet seems to hold firm. A member may not recognize the Queen or abhor the National Anthem, a population may be more English than the English (or more Scots than the Scots) or may sing: 'For all her faults I love her still', or may be frankly anti-English, large groups may speak languages other than English—Afrikaans in South Africa, French in Canada—and architects may look for their inspiration steadfastly to another country rather than Britain—and yet they are all coloured pink in the atlas.

What then can be the point of assembling in an architectural publication the new buildings of States and peoples, just because they belong to the Commonwealth, or, in the particular case of this issue, because they are dominions? One answer is that in all four dominions it is the population of British origin that builds in a twentieth-century fashion. The Dutch Reformed and the French Catholic and Protestant churches are a special case and keep with their respective mannerisms on the margin of developments. Another answer is that in all four the architecture that matters is almost without exception the work of resident architects, whereas Chandighar is a mixed Franco-English affair, and the best in the West Indies, West Africa and Burma is the work of British architects.

Even historically much allows for comparison between the four dominions. The architectural story starts Dutch in the Cape and French in Canada. Groot Constantia with its shaped gables is of about 1690, the Fort de Ramesay in Montreal of about 1710. The finest houses of Cape Town are still Dutch, and retired South African merchants, farmers and civil servants build in Cape Dutch in England. Quebec is purely a French town, with a rampart and bleached shutters, and the churches on the Ile d'Orléans are unmistakably derived from those of France. The British appeared gradually in the great decades of Empire building, and their seal of Georgian red brick was set on Sydney, on Toronto, and with the Anglican Cathedral even on Quebec. Such churches as St. James's, Sydney, or the Anglican Cathedral of Cape Town, wantonly destroyed a few years ago, such houses as The Grange at Toronto might be in England or in New England. The architectural beginnings of New Zealand and Natal are Early Victorian. The Canadian Pacific Railway reached the west coast in 1885, Vancouver, its village terminus, was destroyed by fire in 1886. So the present Vancouver was only begun in 1886, to the year contemporary with Johannesburg which started with the discovery in September, 1886, of gold on the rand. Johannesburg reached its first 100,000 in 1901, Vancouver in 1911. They are the *parvenus* of the dominion cities, Vancouver wearing her wealth and architecture more elegantly.

That for such cities as Johannesburg and Vancouver the establishment of a twentieth-century style raised no sentimental problem must be obvious. Where there was no tradi-

tion the new could be acclaimed with ease. Nor was the situation much different where traditions did exist. They were nowhere as deeply rooted as in England. The mentality of the pioneer, the settler, the emigrant favours novelty. So the soil ought to have been well suited to an early and a complete victory of modern architecture. As things turned out in reality, the victory was not earlier than in such hesitant countries as England and America, and though it was in the end as thorough as in America and far more so than in England, modern architecture was not always what the architectural magazine would illustrate with approval.

A few dates can serve to illustrate the coming of the modern style, a style which had been created in Europe and America between 1900 and 1914 and had left its mark by 1930 well visible at least in the more go-ahead countries. In England by 1930 there were no more than a handful of buildings which had taken notice of the European architectural revolution, in the United States scarcely any. In South Africa, the first were houses of 1932-4 by Rex Martienssen, John Fussler and Norman Hanson, much influenced by Le Corbusier; in Canada the first house was equally Corbusierish. It is by Robert Blatter at Sillery, Quebec, and also dates from 1932. Roy Grounds designed his own house at Mount Eliza, Victoria, in 1933. Mr. Plishke's first 'Continental Modern' house in New Zealand dates from 1939, but he had, of course, built in the same style in Austria before.

The vast area of modern architecture which the survey of the following pages will leave unrecorded is spec builder's housing. This, which in England still looks to Neo-Tudor and in England and America to Neo-Georgian disease, grows in all four dominions in a modernistic vernacular, bright, neat and fairly acceptable if it were not for the almost total absence of planning. Exclaves of planning such as Vanderbijl Park in the Orange Free State, the bit of civic centre at Lower Hutt near Wellington, the much larger and more consistent use zoning of Don Mills outside Toronto are so rare that one takes them more seriously than one would in Europe. The standard is the never-ending suburb of bungalows, widely spaced in well-to-do, crammed together in poorer districts. Never do they make visual sense. They look gay and are well looked after, with their ice-cream shades and their streamlined windows. Modern clichés have been absorbed naturally and vulgarized with disarming success. Only the native housing of the South African cities stays outside this development. It ranges from the sordid shanty town to the regimented estate and is as objectionable mentally in the latter as it is physically in the former. The one thing it has in common with the houses of the whites is that nothing rises above the single storey. Only in Canada is two-storeyed low-price housing an accepted form. The detached dominates everywhere, and that again defeats any attempts at visual planning. Public housing is rare. These are countries of free enterprise. New Zealand, proportionally speaking, has most governmental enterprise in housing. Hutt was developed, not too successfully, on garden suburb principles, and groups of three-storeyed flats also built by the Government Architect's department appear in many places. Of late even high-rise residential blocks have been undertaken. High blocks of flats in South Africa and Canada mean high rents, and Johannesburg and Toronto have some where it also means a high quality of architecture. But vertical accents in horizontal estates are absent everywhere. There is opposition to the mixed developments which England has in the fifties developed so successfully. Where high flats appear, too many appear in one area, and the high office block which in the large cities has become a matter of course can also rise pretty well unchecked. The standard dress is the curtain

wall, a minimum solution as unreasonable in the cold of Montreal as in the heat of Durban or the cold and heat of Toronto. Little independent thought has gone into the problem of marrying modern form with conditions of climates. But little has also been done about this in the United States. Air conditioning is an unimaginative answer, and, moreover, the curtain wall has more often been copied in the dominions than the air conditioning.

That Toronto should look to Detroit and Chicago, and Vancouver to Seattle, San Francisco and Los Angeles is nothing surprising. But that throughout the four dominions England as a source of inspiration has been eclipsed by America calls for some thinking. Sentimental ties with the homeland have not snapped anywhere. When it comes to juries, to a fair judgment on national or international matters of architectural design, the best English experts were called to Canberra, to redress the damage done to Walter Burley Griffin's plan and to Sydney and Toronto to decide who should build the Opera House and the City Hall, and Robert Matthew was commissioned to build New Zealand House in Pall Mall. Moreover, the professors of architecture in Cape Town, Melbourne, Sydney, Toronto, Auckland, to name only a few, were trained in England. One would expect that they would determine the direction in which their students would look. But that is not so and perhaps could not be so.

Once again, for Canada the proximity to the United States was too close to be resisted. The Canadian speaks of gasoline not of petrol, of high school and sidewalk, of highway and subway. As for Australia and New Zealand, it ought to be remembered that their world is centred in the Pacific not the Atlantic. California is nearer than England and in climate and ways of life more akin. That leaves South Africa, where Johannesburg is the architectural centre. What could be expected of so new and booming a town other than to be attracted by a new and booming country. This applies to commercial architecture primarily, but the architect of private houses also is attracted by a country of wide spaces and baffled by so close and intimate a scale as that of the English countryside.

So here is a situation which allows for the four dominions to be seen together. The architects who now lead are their own, not as a rule immigrants. Their roots are in Britain, but their eyes are on the United States. They are not hemmed in by tradition, by the preservation of worthwhile older buildings, and so they enjoy a mental and material freedom which may well be envied. Have they then succeeded in absorbing a style created and developed by others, in making it their own and in creating work that can stand by the side of the best abroad? The following pages present the material to answer this question; but any answer must remain personal. If on the strength of this introduction certain names may be put forward as candidates, I would propose John Parkin and Charles E. Pratt in Canada, Roy Grounds and Walter Bunning in Australia, and H. W. E. Stauch in South Africa. But South African work is on the whole too anonymous to qualify and work in New Zealand too small. But the houses by Norman Eaton and Werner Plishke and the high slabs by Gordon Wilson, late Government Architect of New Zealand, can all the same not be left out.

The buildings illustrated in the album which follows are selected for aesthetic reasons. In many cases one would have wished to be able to give them more space. Planning and structure had to be neglected. Plans, it is hoped, will speak for themselves. As regards building technique and building conditions four supplements are added, starting on page 218, which deal with the building industries, and native and imported products, in each of the four dominions.

CANADA

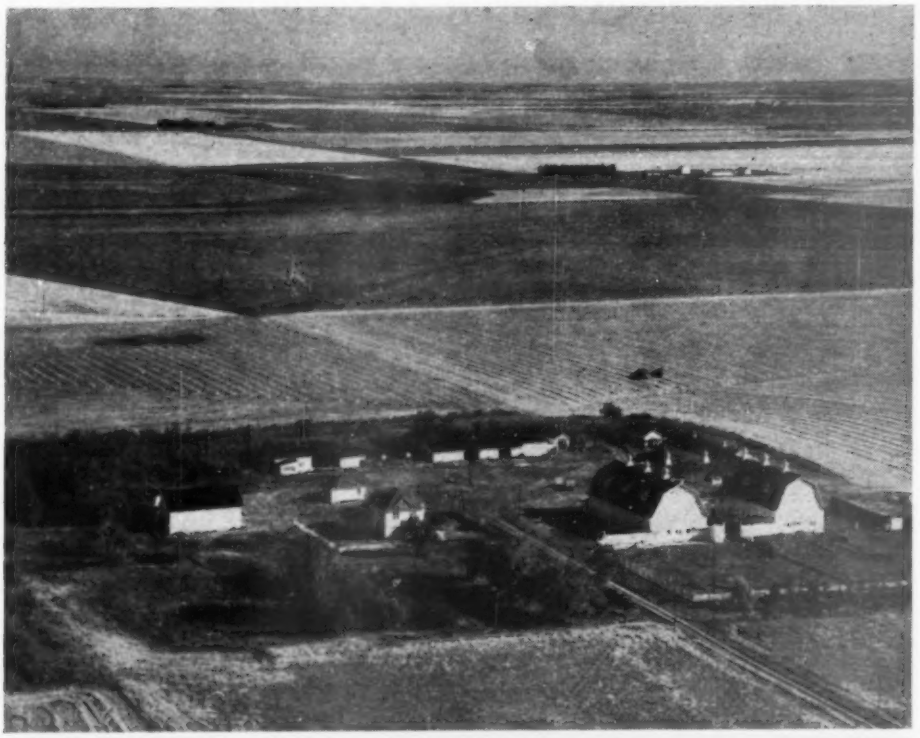
To define the nature of Canadian architecture is to embark upon the definition of a mirage. It flitters in the landscape. As you approach it, as you stretch out your hand to touch and open your mind to comprehend it, the phantom vanishes. In its place the landscape reappears, a landscape which has all the variety one would encounter travelling between Bordeaux and Vladivostok. Can one visualize clearly a Canadian architecture with such a kaleidoscopic background?

The country's history, its geographical position, north of the United States, west of Britain and France, and east of the Orient, its pattern of multi-racial settlements, its economic and social dependency are all factors contributing to a blurring of outlines, a conflict of motives, and indecision as to what is right for Canada, the whole of Canada. Nevertheless, in this architectural penumbra, certain clear statements are being made. The merging of these will perhaps result, over the years, in an architectural expression which can be defined as 'Canadian.' What are some of these architectural statements?

With a powerful country such as the United States sharing 4,000 miles of boundary, and being the only country with which Canada shares an active boundary, it is inevitable that the influence of this colossus should be quite considerable. This has been evident ever since the war of 1812–14 between the two countries. Since that war a growing friendship has linked them in many forms of joint enterprise and exchange of ideas. Economic rivalry and, eventually, domination and exploitation has not hampered this exchange. On the other hand, the many American-owned enterprises in Canada have brought very definite architectural influences. The vast amount of printed material, trade literature, architectural magazines and books or other cultural works which come to Canada from the USA have made the Canadians

conscious of developments in that country as they are conscious of developments in no other country. Also the good expressways which link Canada to the United States are crowded with sightseers. Canadians form the largest national group of visitors to the United States. It is therefore not surprising to find, since the middle of the last century, an increasing number of buildings the designs for which have either originated in the United States or have been derived from American examples. The work of Richardson in the Boston area had a great influence at the end of the nineteenth century and the beginning of this one, when many buildings throughout eastern Canada, and even some in the west, emulated a large-paned type of romantic Romanesque, amplified with turrets and bay-windows. Today, Skidmore, Owings and Merrill are exerting a similar influence.

As to Canada's own architectural history, one period should be mentioned especially. This was the period of the great pioneering barons who were developing their financial and political empires. This was the Canadian Victorian era and it was a good



1, the wide prairie landscape; in the foreground dairy barns typical of this area of Saskatchewan.
2, a night view, showing how the newest architecture is beginning to dominate the fast-growing city of Vancouver.

3, the strong period-revival tradition in the older Canadian cities: the Chateau Frontenac Hotel in Quebec, perched above the ancient lower town.

reflection of the same era in the home country, England. Only, in Canada it gained a greater zest and vitality. It was an eclectic period, but also a creative one, when any building was considered as a historic challenge, resulting in more exaggeration, greater lustfulness. Unfortunately these buildings are impossible to live in today, and they are fast disappearing from Canadian cities to make way for blank-faced intimidated curtain-walled boxes, reflective of the current spiritual poverty.

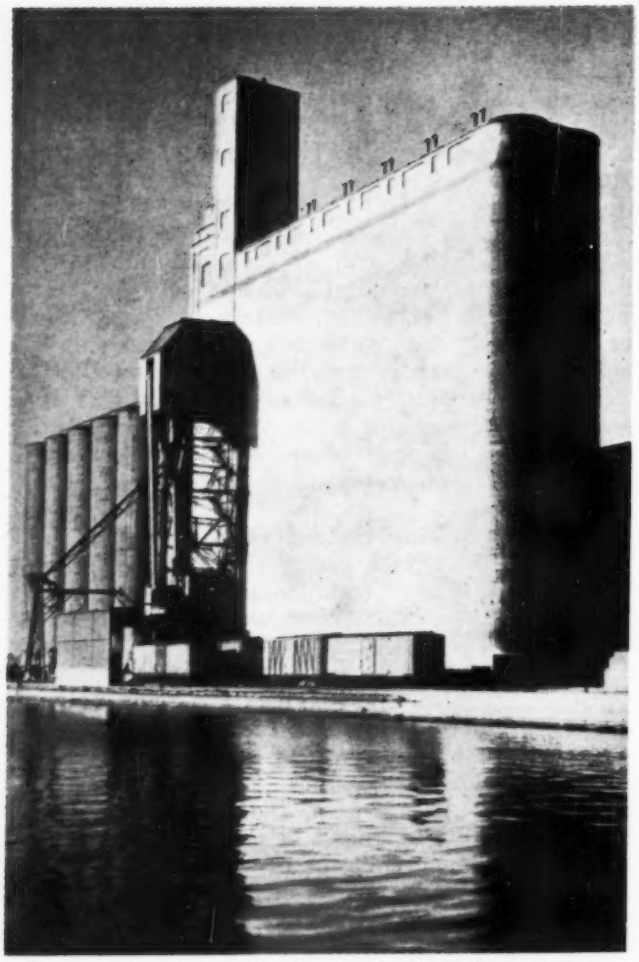
At the height of Canada's expansion westward at the turn of the century, especially during the years immediately prior to World War I, immigration was encouraged and up to over 400,000 people a year came to settle there. While the majority came from the British Isles, continuing the importation of British culture, great numbers came from other countries, especially from northern Europe and the Ukraine. Across the land, in every city and on many a farmstead, a bit of Europe was transplanted; an onion-shaped dome or cupola, a bit of Polish fretwork, a Dutch gable, Scandinavian reds and ochres and their flat trim-surrounds, Germanic precise window rhythms, Swiss chalet balconies and Ukrainian farm porches. Out of this melting pot, combined with the original French and subsequent British cultures, a native architecture is perhaps in the making. But the giant to the south is also a multi-nationality boiling pot of ideas, influences and traditions. So again it is natural that the architectural paths of these two countries should be similar.

On the far west coast, in British Columbia, particularly in its magnificently set major port city of Vancouver, a somewhat more independent development has taken place. Predominantly British, this area has also long felt the influence of the Orient. It has been ready to accept ideas in the use of wood from Japan, in fretwork decoration from China and in modular and open planning from both. This region has led Canada in exploring new architectural ideas as it has in painting, and its contemporary houses and other buildings have a distinction which has induced the 'BC style' in eastern Canada. Some office buildings and numerous residences in the Vancouver area are as fine as can be found. The BC Electric Company's head office building is considered by many critics to be the most gracefully handsome office building erected anywhere, a building which has a full integration of the work of artist and architect.

The years following the second World War have seen the emergence of a younger group of architects who are little different from young architects in any country. They revolted from eclectic and Victorian architecture. They became contemporary eclectics. Others tried desperately to be different and unique, but the curtain-wall and sheer façade, with little or no relief, gradually became insidiously pervading and the dominant trademark of modern architecture. But revolt is now setting in.

The country's largest firm, J. B. Parkin and Associates, which patterns itself after Skidmore, Owings and Merrill with a little more of Mies van der Rohe's influence, has moved towards a greater plasticity in the exterior treatment of its buildings and greater formality in its plans. This firm's influence on architectural thinking is considerable. In a similar style, and with equal influence, Green, Blankstein Russell

4, in a prosperous Toronto suburb: the favourite traditional style of brick and timber houses.



5, the grain storage elevator introduced the functional shapes of modern buildings into Canada before the arrival of the modern architect.

and Associates of Winnipeg, Thompson, Berwick and Pratt of Vancouver, and Lebensold, Affleck, Desbarats, Dimikopoulos, Michaud and Sise, of Montreal, have been blanketing the country with competent, well-designed buildings. They are not as technically perfect and impressive as their American counterparts. They are, perhaps, softer in appearance with a greater human content as a result of a lesser degree of industrial fabrication of their parts.

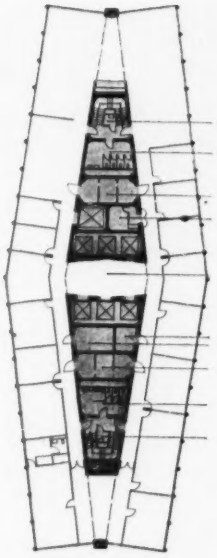
Besides and beyond these large firms are a number of small firms and individuals, too numerous to name, who are the conscience of the profession and who are primarily the products of the schools of architecture since the war. These architects are trying to bring back design dignity to the profession. Their designs are controlled and follow a simple order in the planning, in the structure and in the visual effect. Symbolism, significant form, is receiving more attention as are some basic precepts: the articulation of the base, the body, the cover, and of the major components, structure, entrances and windows. There is a strong move away from the arid curtain walls, which may unfortunately cause its elimination from many logical uses. The move is not a purely negative one, as it emphasizes human reaction to the building: the need for man to find visual and emotional contact and pleasure as he experiences the building. This approach lays more stress on the aesthetic solution than on technical achievement, and herein lies the potential for a major difference between Canadian and American architecture.

In Canada there are five schools of architecture: in Montreal, McGill and the French l'Ecole des Beaux Arts; in Toronto, in Winnipeg and in Vancouver. They all follow the usual pattern of a five-year professional course following senior matriculation or first year of Arts and Science. The standard is high and comparable to the best schools in the United States. The youngest school, at the University of British Columbia, Vancouver, is, however, breaking rank. It will require at least three years of Arts and Science, or normally a Bachelor's degree in Arts or Science, prior to entry into a professional course having a minimum of three longer-than-usual academic years.

In conclusion, the North should be mentioned. This vast lake-studded frozen area of rock, tundra and scrub trees is offering tremendous industrial opportunities. Currently it is a vital part of the North American defence system. Modern science is invading this lonely primitive land. It may be that in solving the unique building problems of this area a truly Canadian form of architecture will emerge, re-shaping the modern-eclectic forms of the southern populated belt of the country.

The many trends of the country, a country of many national heritages and of many geographic regions, needs a catalyst. That catalyst may come from the north but it will act differently in Canada's various regions, in the maritime Atlantic provinces, in French Canadian Quebec, in industrial Ontario, in the flat spacious and rigorous Prairies and in the mild-weathered and scenic Pacific Coast area. A Canadian architecture is unlikely. A Canadian architectural contribution is much more of a possibility.

CANADA



typical floor plan

Offices in Vancouver (architects, Thompson, Berwick and Pratt), 1, for the BC Electrical Board, who already had a sub-station by the same architects on part of the same site, which had to be fitted into the scheme. The twenty-four storey steel-framed tower, which has been widely praised, has a double-tapering plan, above, in order to secure the most compact possible planning of the service core and circulation spaces, but all the office areas are rectangular in plan (except for the ones behind the angles of the two main façades) even at the end of the block, thus producing the re-entrants seen in the illustration. The cladding is of enamelled steel and double-paned glass.

2

3

Office block, Toronto (architect, James A. Murray), 2 and 3, a straightforward curtain wall design—no advertising is allowed in the largely residential area where it is sited—on a reinforced concrete frame. Unusually for such a building, the lower part is a club, with restaurant in the basement, and lounge bar on the ground floor. The staircase, illustrated, is carried on a single spiral beam supported only at top and bottom.

4

Office Block, Toronto (architects, Marani and Morris), 4, for the Shell Oil company, on the avenue linking the business centre of the city with the Ontario Parliament Buildings. The main, twelve-floor tower rises from a T-shaped ground floor whose arms, parallel with the street, conceal Car-parking areas. Maximum flexibility of partitioning and services was a primary design consideration, while extension of the block upwards by adding more floors is also envisaged, when the service floor containing mechanical equipment at the top of the present tower would remain as an intermediate distribution floor. At the client's wish, extensive use has been made of native Canadian materials for finishes. The building is air-conditioned.

5

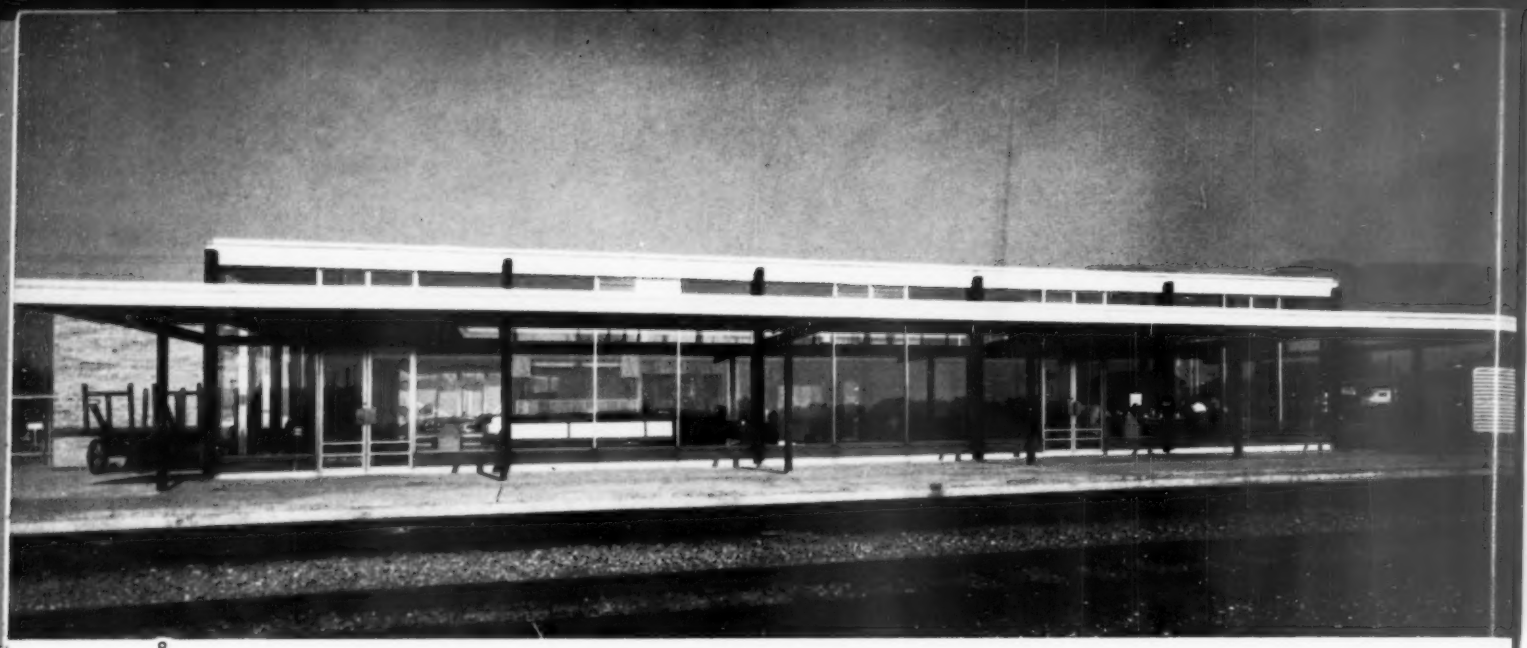
Highway bridge, Belly River, Alberta (designers, Toronto City Roads Department), 5, in four pre-stressed, pre-cast concrete spans, each of eighty feet.

6

Highway Intersections, Lakefront and Humber River, Toronto (designers, Dept. of Roads, Municipality of Toronto), 6. From left to right, the Queensway, the Canadian National Railway, the Frederick C. Gardner Expressway, Lake Shore Road. The added complications of mating a tramway system with express motorways will be noted.

7

Parking garage, Dundas Square, Toronto (architects, John B. Parkin Associates), 7, one of two such garages built for the Toronto Parking Authority. Both are somewhat alike in plan, with parking accommodation disposed on either side of the lifting gear that raises the cars, and moves them horizontally to their allotted bays. Economic considerations, coupled with an awkward triangular site at Dundas Square, called for great ingenuity in securing a workable ratio of structure to cars accommodated, and the very small tolerances on levels permitted by the mechanical equipment made it necessary to carry the foundations of the concrete structure down some 48 feet in order to avoid differential settlement.



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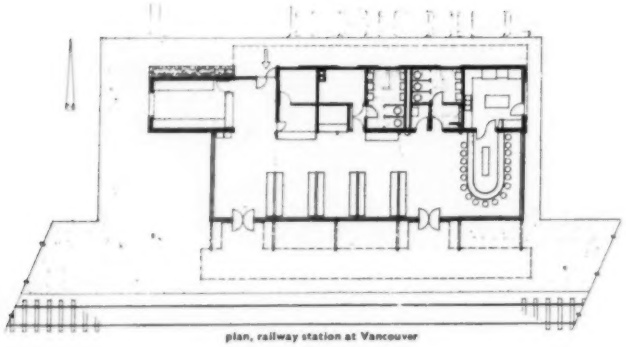


plan, railway station at Vancouver

Railway Station, North Vancouver (architects, Hale Harrison Associates), 8, built to handle the small, but probably increasing, passenger traffic on the Pacific Great Eastern since its final link-up with Vancouver. The steel-frame passenger building has therefore been planned with expansion in mind. The concourse/waiting area has a bar as well as the usual facilities, and is completely glazed on the side toward the tracks, to afford maximum view of railway operations.

City Hall, Edmonton, Alberta (architects, Dewar, Stevenson and Stanley), 9, occupying a site between 99th and 100th streets, whose lack of parallelism is echoed in the angles chosen for the 'lenticular' plan of the main office tower, and the splay, on plan, between the projecting council-chamber and the lower public block to the right.

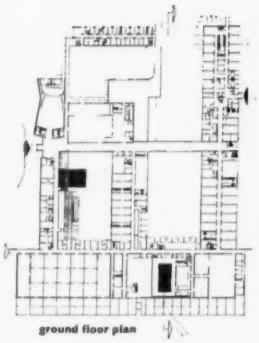
9

Alberta Jubilee Auditorium, Edmonton, Alberta (architect, Ronald Clarke), 10. Erected, at the same time as a similar building at Calgary, to commemorate Alberta's fiftieth anniversary in 1955, the main auditorium has a seating capacity of over 1,500 people and is designed for orchestras, operas and road shows as well as for presentations by local groups. In addition to the auditorium and its ancillary spaces, there are large promenades, club rooms, an exhibition area and a main social room with flanking smaller activity rooms. The structure is steel-frame with six three-hinged steel arches spanning the auditorium. The exterior is finished with precast concrete panels and brick except for the main entrance which is faced with polished travertine.

Hospital and Rehabilitation Centre, Weston, Ontario (architects, Page and Steele), 11, planned as far as possible on one level, to facilitate the movement of the patients, who are workmen injured in industrial accidents. The plan encourages walking, which is part of the cure, and the occupational therapy wing has a deliberately industrial atmosphere. Structure is steel for the single-storey wings, reinforced concrete for higher blocks for 500 patients.

10

11



ground floor plan

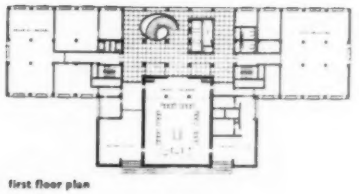
Municipal offices, York Township, Ontario (architects, Shore and Moffat), 12, 13. Set back from a main avenue, and placed at an angle, to give the best natural lighting and take advantage of a view up the valley to the north-west. The various departments occupy two floors and basement, with those requiring most contact with the public on the ground floor. The Police department is in a separate block, with a car park between it and the main building. The offices are openly planned with the public space along the south side of the building separated from the working space only by counters or low partitions. On the first floor of the main building are the council chamber and committee rooms.

12

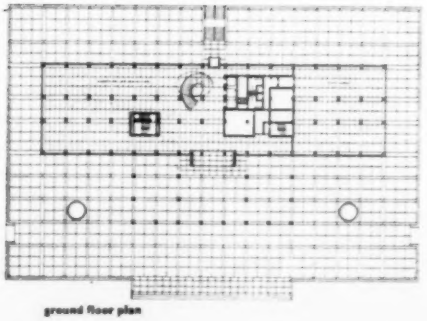
13

14

City Hall, Ottawa (architects, Rother, Bland and Trudeau), 14-17. The site is on an island in the Rideau river at the head of the Rideau Falls, which drop into the Ottawa river eighty feet below; two major roads cross the island and link it to the town. There is an eight-storey administrative block with a staff cafeteria on the top floor, and a three-storey legislative block. The main public spaces are on the ground and first floors. The structure is a steel frame on concrete caissons taken to rock fifteen feet below ground level; a paved platform, slightly above street level at the front of the building, is the roof of a parking garage for 150 cars.



first floor plan

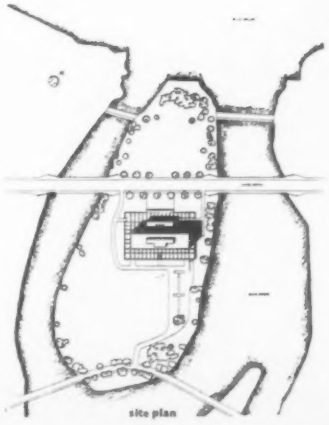


ground floor plan

15

The curved main stair, 17, leading from the ground-floor reception area to the council chamber is of polished reinforced concrete, supported only at its ends; the treads are of white marble. The exterior of the building is faced with Canadian limestone and the interior finishes in the public areas are white marble and honed Canadian limestone. The council chamber is panelled with walnut. The building is fully air-conditioned.

16



17

18 | 20
19 | 21

Shopping Centre, Don Mills, Ontario (architects, John B. Parkin Associates), 18, a group of small shops served by a pedestrian mall with planting and covered ways, part of the cluster of commercial and merchandising blocks on Lawrence Avenue East.

Banking Group, Don Mills (architects, John B. Parkin Associates), 19, also on Lawrence Avenue East; a standardized architecture, related to that of the shopping centre, applied to a group of drive-in banks.

Pharmaceutical Factory and Offices, Don Mills (architects, John B. Parkin Associates), 20, a two-storey concrete framed block (the illustration shows the office entrance) with most of the offices at first-floor level and laboratories and work-spaces behind.

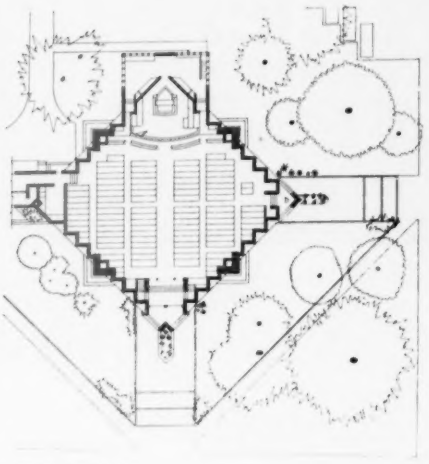
Housing, Don Mills (architects, James A. Murray and Henry Fliess), 21. 120 houses in blocks of four to six, each with its own garden. Houses are mainly of two types: a two-and-a-half floor type with a well-lighted basement, L-shaped living-dining room and three bedrooms above, and a split-level type with dining-room and kitchen at the entrance level and a sunken living-space and bedroom opening into the garden; other bedrooms and bathroom are up a half flight of stairs from the entrance level. The houses are grouped round common landscaped spaces, with car-parking out of view from the windows. They are in brick with shingled roofs and white painted door and window frames.

22

Federal Building, Don Mills (architects, John B. Parkin Associates), 22, a square block, not unlike a larger version of the banks in 19, above. The public hall for the post office lies across the front of the building, set back from the columns carrying the roof (the other walls are flush with the structure) and one of its entrances is seen in this view.

23

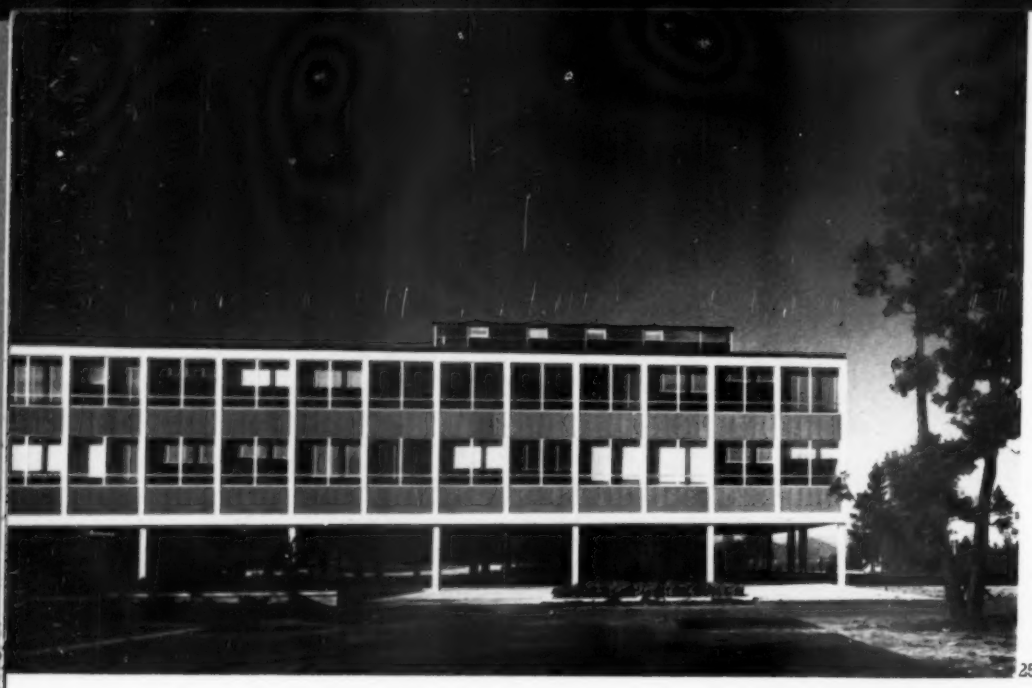
Church of Notre Dame du Bel Amour, Cartierville, Montreal (architect, Roger D'Astous), 23. Planned on the basis of a square whose diagonals are the ridges of a star-shaped vault. Eight triangular reinforced-concrete slabs rest on four piers. A continuous pleated strip of redwood window breaks up direct sunlight and helps to diffuse interior sound.



Church at Cartierville

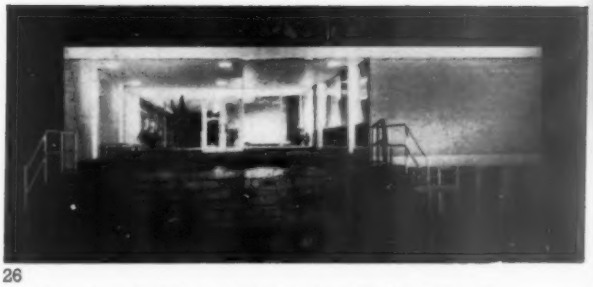
24

Church at Toronto (architect, James A. Murray), 24. Called the Yorkminster United Church, it is planned for a congregation of 500 with accommodation for social activities and Christian education. The approach from a main trans-Canada highway, with cloverleaf intersection which sets the scale, is by covered way alongside a sunken garden. The church hall and kitchen, which are at a lower level, are in reinforced concrete and the main floor is supported on steel beams. The superstructure is timber, with a frame of laminated members.



25

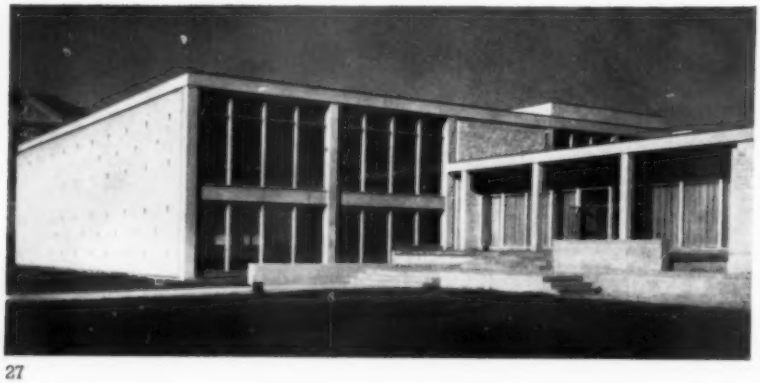
Arts Buildings, University of British Columbia, Vancouver (architects, Thompson, Berwick and Pratt), 25, a complete collegiate unit, comprising a class-room block with open ground floor giving on to a court flanked on one side by an office wing, and on the other by a block of acting-studios and class-rooms; between this last and the main class-room block is a link unit with entrances, foyer and staircases.



26

Headquarters building, Toronto (architects, John B. Parkin Associates), 26, for the Ontario Association of Architects. This competition winning design for a building to house one of the oldest architectural bodies in North America was fully illustrated and described in AR, May, 1955.

Library, University of Manitoba, Winnipeg (architects, Green, Blankstein, Russell and Associates), 27. The library building which includes a 75-seat theatre, exhibition space with a lounge opening off it and a small serving kitchen, is connected by a tunnel to the adjacent Arts Building to the south. Control of the library is split between two main desks, one on each of the ground and first floors; a book lift runs directly from these to the stack spaces. The structure is a reinforced concrete frame with hollow-core columns through which air is distributed to the stack areas. Exterior walls are of Manitoba Tyndall stone, random ashlar pattern; interior surfaces are oak and walnut panelling and plaster-sand finished.

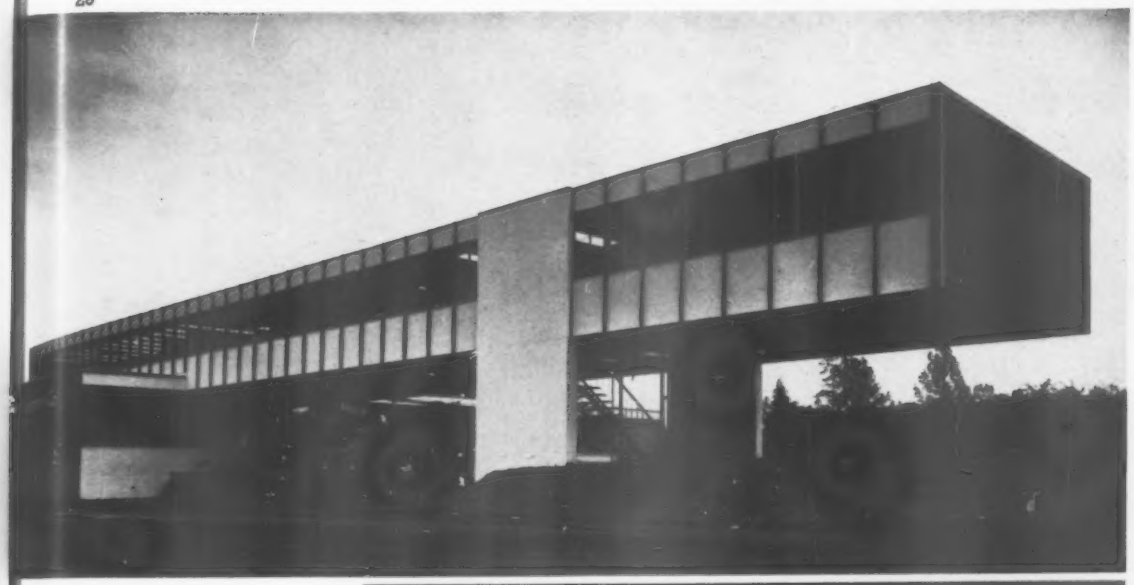


27

Secondary School, Kitchener, Ontario (architects, Barnett and Rieder), 28, a steel-frame building of more or less cruciform plan to house Eastwood Collegiate Institute, a secondary school. The long arm of the plan consists of a two-storey class-room block with a double-gymnasium at its head, but at a lower level because of the fall of the site. The cross arm contains the administrative block (visible in illustration) on one side, and the auditorium on the other.

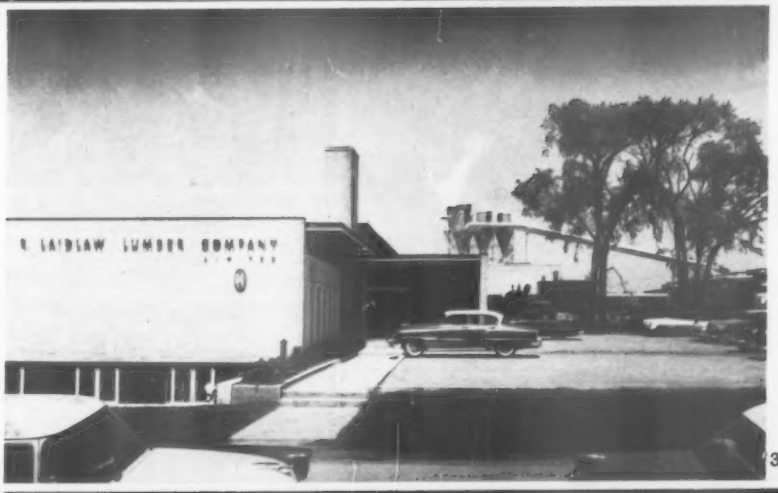
28

29



Construction Plant Depot, Burnaby, British Columbia (architects, Thompson, Berwick and Pratt) 29, a display and service centre for earth-moving equipment, etc. Workshops, spare-parts store, and canteen are at ground floor level, together with open-air display areas that are partly sheltered by the steel-framed office floor, with its last eight bays cantilevered, above them.

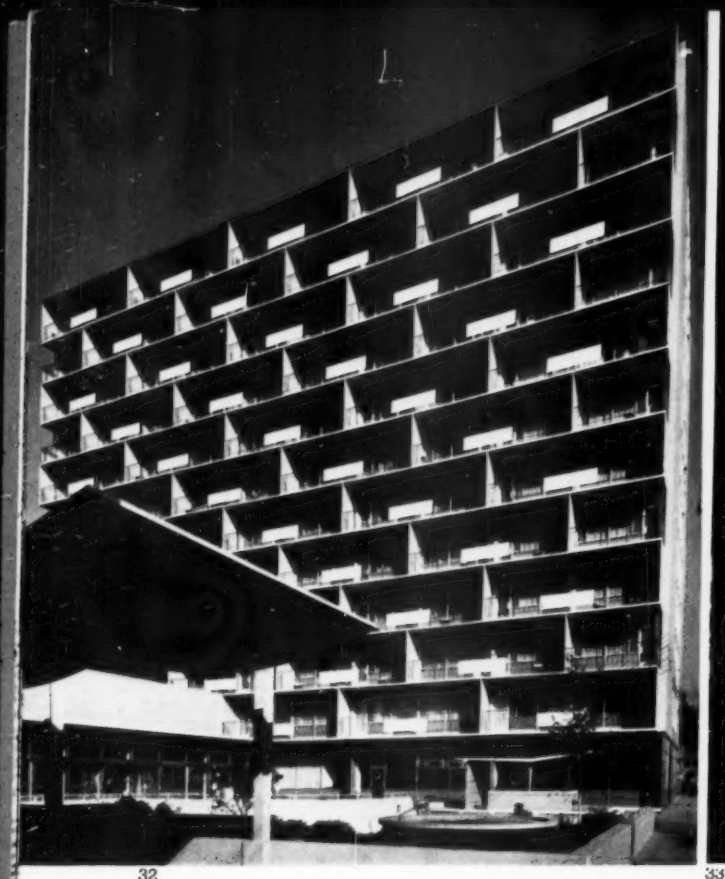
Racecourse, Etobicoke, Ontario (architect, Earle C. Morgan), 31. With a view to future expansion the Director of the Ontario Jockey Club purchased 800 acres for this new racecourse. The present 1,100 horse stalls can be increased to 1,400; parking for 16,000 cars can be increased to 40,000; the stand which now seats 8,000 can be enlarged to seat 22,000. The Grandstand has four seating levels and the clubhouse three, the fourth level being the director's floor. The main betting ring floor is at the top level of the apron, approximately 15 feet above grade at the rear entrance side of the stand, thus freeing the grade level area for the many ancillary requirements of a race track. The grandstand roof is in the form of a huge truss supported at back and centre, and cantilevered over the racecourse side.



30

Lumber Factory, Weston, Ontario (architects, Pentland and Baker), 30. The site is on the outskirts of Toronto's metropolitan area. In addition to the factory, warehouses and lumber yard, there is a general office building designed as two blocks linked by a main stairway. Timber and glass are the materials used throughout. A bay size of twenty by forty feet was chosen as the one best suited to the eighteen foot maximum lumber length and the four by four palletted packages and four by eight plywood sheet. The only exception being the millwork factory, where, because of the process, eighty foot spans were necessary ; these support open trusses, glazed on the exterior face, on a ten foot module. The exterior walls of the factory and warehouse buildings are of three inch tongue-and-groove western Canadian cedar. Structural framing is glue-laminated beam and post. The office building is sealed and fully air-conditioned.

31



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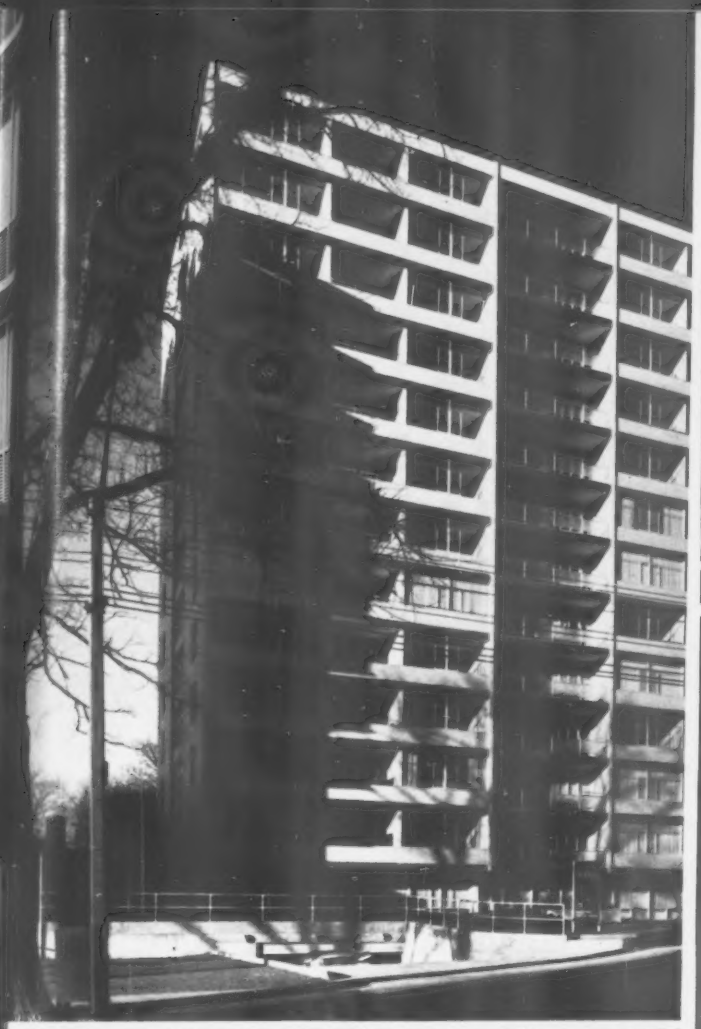
33

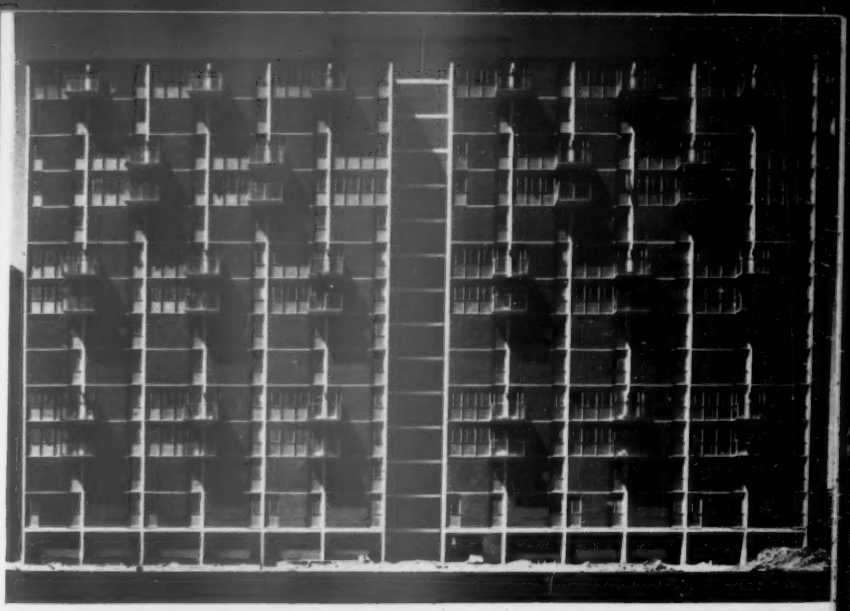
Hotel Extension, Toronto (architects, Page and Steele), 32, a new wing added to the existing structure of the Park Plaza Hotel, and joined to it by way of a foyer and communicating public rooms. The first floor of the concrete column-and-slab structure has staff and reception rooms, the ground floor a dining room, lounge and rentable space. A drive-in court, underground car-park and loading-bay also help to relieve traffic pressure on surrounding streets.

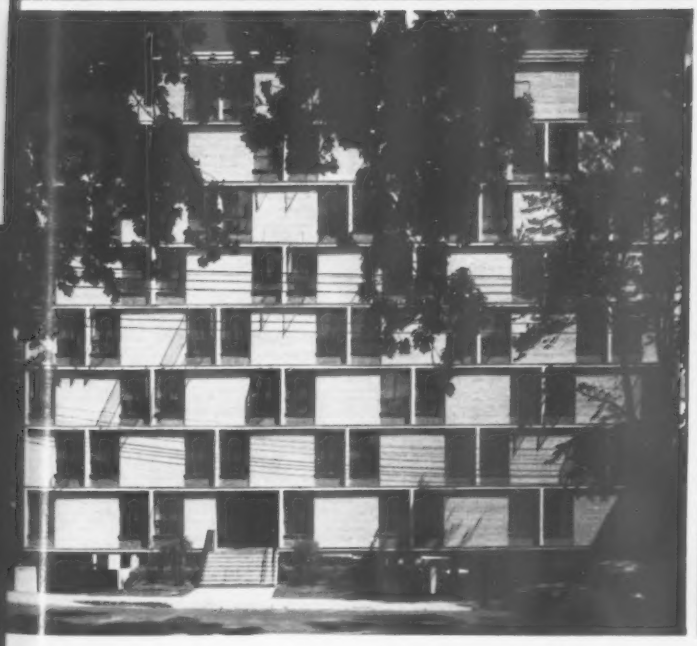
Seaway Hotel, Toronto (architects, Elken and Becksted), 33, at the western approach to the city, on made ground between Lake Ontario and the railway. It has 111 rooms on four floors, all facing the lake with a corridor on the other side. At the east end, nearest the city, is a two-storey block containing restaurant and convention and banqueting hall. It has a concrete frame, with end walls of red brick.

Festival Theatre, Stratford, Ontario (architects, Rounthwaite and Fairfield), 34. The site falls 17 feet from south to north, and the auditorium seating, the stage and most service facilities are below ground level. The building is a 200 foot diameter circle in plan with a 40-foot foyer extending 160 feet along the south-west side. The arc of the audience area in the main auditorium occupies 220 degrees and each member of the 2,192 audience has a view unobstructed by any vertical supports. This is achieved by a 'parasol' roof of 34 steel beams carried by a concrete ring resting on the inner columns of the promenade. The beams are locked together at the top, and stiffened by struts at two-thirds span, while the concrete ring is buttressed by the folded slabs of the promenade roof.

34







Flats, Toronto (architects, Page and Steele), 35, at 500 Avenue Road, a newly developing area of high quality apartment buildings. The reinforced concrete structure accommodates eight large apartments on each of twelve main floors, with car-parking in the basement to clear all the rest of the plot for landscaping.

Flats, Toronto (architect, James D. Murray), 36. The building is raised half a floor above ground to provide a car park beneath. The structure is of reinforced concrete, and there are eighty flats in the building which is on a high-density city site.

Re-development housing, Toronto (architects, Page and Steele), 37, Regents Park South, a mixed scheme of terrace-houses and high-rise blocks such as that shown here. The tall blocks have, effectively, cross-wall construction and skip-level sections, with maisonettes opening up and down from the access corridors, as the elevation clearly shows.

Flats, Toronto (architects, Page and Steele), 38, at 561 Avenue Road, an earlier part of the development illustrated in 35. The fourteen-storey reinforced-concrete structure has six flats per floor, each with a balcony, basement car-parking, ground floor lounge and dining room. On some floors the standard flat-plans have been varied to tenants' requirements.

39

Flats at Calgary, Alberta (architect, Peter Caspary), 39. The six separate buildings (set in 14 acres of gardens) comprise eight basic types of flat, from 2 to 4½ rooms, though two of the types can be combined to produce 7 and 8 room flats. All flats above the ground floor have balconies running their entire length with views over the Rocky Mountains. The scheme includes a neighbourhood store. All windows are double-glazed and there are automatic laundries for the use of the tenants.

Flats at Toronto (architect, Peter Caspary), 40. Situated in the centre of Toronto, on a four acre site, there are three fifteen-storey blocks with five different types of flat, ranging in size from the bed-sitting room to the two-bedroom flat. Each, above ground, has a full width balcony. The structure is of reinforced concrete; the main entrance hall, which has murals in Italian mosaic, has floors of green, and walls of yellow, marble. All windows are wood-frame, double-glazed, screened and have bamboo curtains provided inside. There are three underground garages and a surface park, providing facilities for 550 cars.

40

House in Toronto (architect, Irving Grossman), 41, in a newly developed suburb. The entrance is through a small sheltered court with a pool and fountain. Most rooms face the back where there is a view of a wooded ravine. There are no windows at the sides. The sloping site allows the lower level to open on to a terrace, which is sheltered by the living room balcony above. The cross-section, with secondary bedrooms on an upper floor, arose from local by-laws requiring two-storeys for part of the house. Construction is load-bearing brick with stone external walls and timber floors and roofs.

House in Ottawa (architect, C. B. Greenberg), 42, a three-bedroom timber house on a wooded site, the bedrooms lying across the house behind the blank wall to the left in the illustration. The rest of the house, which is glazed almost down to the floor on both sides, consists chiefly of a very large living room containing a kitchen area backed up on a bathroom/toilet core which separates it from the bedrooms.

41

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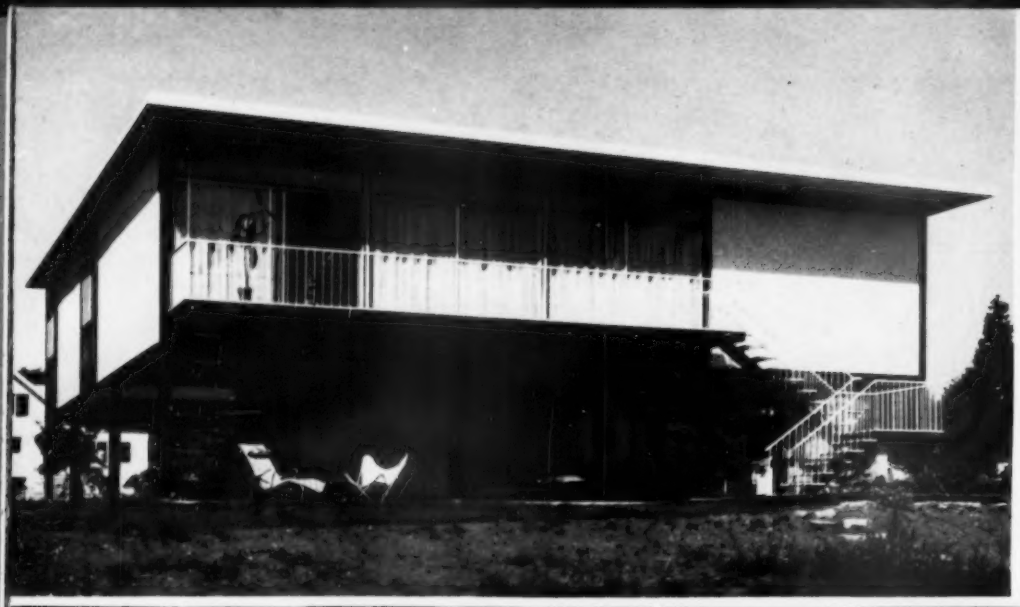
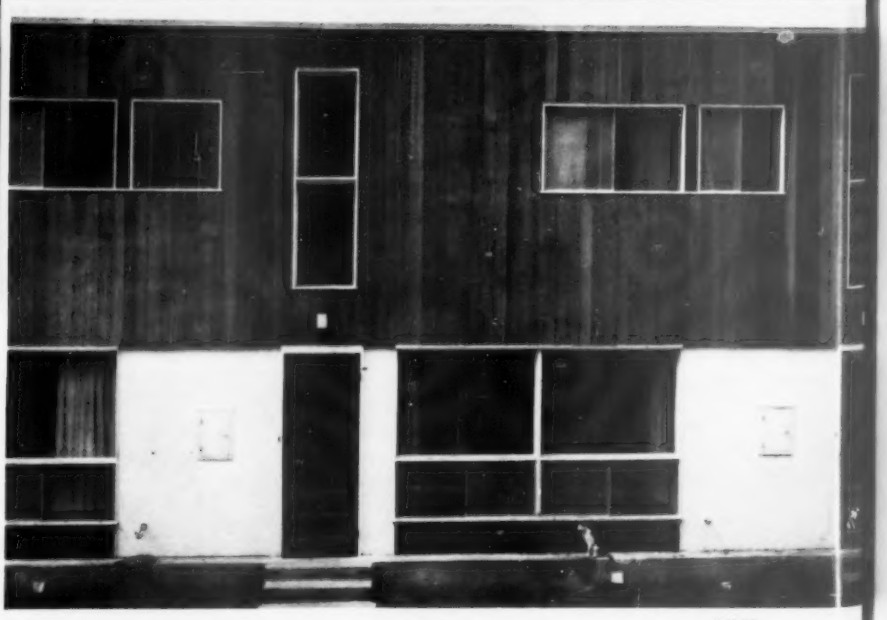
House, Hamilton, Ontario (architect, Jerome Markson), 43-45. The structure is of steel box columns and exposed steel beams with walls of American beige brick. Inside floors are white terrazzo or broadloom on a concrete slab supported on open welded steel joists; the roof is a wood deck on open-welded steel joists. Panelling and trim throughout are of walnut and the window frames of natural fir with insulated double glass. Bathrooms are lined with Italian mosaic tiles.





House, Vancouver, British Columbia (architects, Leon G. Dirssar and H. Peter Oberlander), 46, 47. Standing in a large meadow facing south across the Straits of Georgia, the house is virtually a box on a table, the first floor being a conventional wooden frame structure supported on wooden posts and beams. All the living accommodation is on the first floor and a balcony across the south living room wall leads down to a sitting-out area which, with the rest of the ground floor, provides a sheltered space for open-air activities in a climate which, though mild, is often very rainy. Windows and doors are aluminium frame and slide horizontally. Housing, Stanrock Uranium Mine, Elliot Lake, Ontario (architect, Jerome Markson), 48, 49, 50. Elliot Lake has a population of 25,000 though its development began only three years ago. The houses had to be economical to build and operate. The foundations and retaining walls are of poured concrete, finished with white rendered concrete and cedar siding; the asbestos-cement on the two-storey row houses is painted in different shades of brown. The double-glazed fixed and sliding windows are in pine frames.

46 | 47
48 | 49
50

SOUTH AFRICA

The Union of South Africa is situated at about the same latitude as Australia. In size the Union is only one-sixth that of Australia. In climate the variety is no smaller. The greater part of South Africa is on a high plateau, some 4,000 to 6,000 feet above sea level. There are mountain ranges along the periphery, and they fall to the narrow coastal strip in spectacular grandeur. Of the whole of South Africa only one-third has more than 25 inches of rainfall a year (as against 30 inches for Norfolk and 60 inches for Wales). The rest is arid. Except for a small region of winter rains in the western Cape and a smaller one along the south coast with rain all the year round, the country has summer rains, that is, regular six-months' droughts.

The Drakensberg, which borders Natal and rises to peaks of 11,000 feet sends rivers down swiftly to the Indian Ocean, but sparsely and sluggishly to the Atlantic.

Yet the differences in the architectural character of the various parts of South Africa, as far as urban areas and their surroundings go—the only areas on the whole where modern architecture is to be found—are due to differences in history and in population rather than climate. The differences are remarkably great, much greater than those between Sydney and Melbourne, Adelaide, Perth and Brisbane.

The Cape has a Dutch Baroque and a Huguenot tradition which are felt to this day. The Cape Dutch monuments are cared for and have had their revival in South Africa and Britain on the drawing boards of Sir Herbert Baker and his school. The Castle at Cape Town goes back to the seventeenth century, houses in the town to the eighteenth. In 1806 the town became British, and its white population is now largely English. Half the population is coloured, i.e. mixed white and dark. The town is magnificently placed below Table Mountain and has near and far surround-

ings of exquisite beauty. With a July mean of *c.* 55 and a January mean of *c.* 70 the climate is a delight. Durban is hotter. The corresponding figures are *c.* 63 and *c.* 75. The latitude is about that of Brisbane. Instead of Table Mountain there are green hills behind the town dotted with the wealthier houses. The history of Durban is considerably younger. It started as a town only about 1850. It is now the most English of the cities, though its population is only one-third white, the second being Asiatic, the third African. Johannesburg is one of the youngest of the greater cities of the world. Nothing existed on the site until in 1886 gold was found on the Witwatersrand. The boom which followed was enormous, and the city has some aspects of a boom-town even now. The tempo is strikingly different from Durban and Cape Town. Even the climate is sharp and stimulating. The city lies 5,750 ft. up. Mean July temperature is 50, mean January temperature 67. Winters are remarkably dry. The population of Johannesburg is about 350,000 white, about 525,000 black. Only Pretoria of the larger towns has more of the white than of the dark race, and Pretoria is predominantly Afrikaans.

The division into English and Afrikaans in the Union can only be compared in the British Dominions with that between English and French in Canada. In the census of 1936, 53 per cent of the population were registered as English-speaking, 41 as Afrikaans-speaking. In Canada the corresponding figures are 42 per cent English origin, 28 per cent French origin. The Canadian French may have their grievances against the Canadian English, but there is nothing like the animosity of the Afrikander against the British, and, of course, the Afrikander rules the country.

That is one thing which distinguishes South Africa from the other dominions with which this number is concerned. It results in a state of tensions trying to experience. The other tension is that between the thinking African population and the whites of either origin. Two-thirds of the population of the Union are black, ten per cent coloured. The tension which this is creating, largely owing to mismanagement by the Nationalist government, is infinitely more dangerous than that between the two white races, though connected with it. It may well one day blow up all that the following pages illustrate. So, while emigrants to Canada, Australia, New Zealand go to countries of greater safety than their own and to prospects steadier and more ample, the equally optimistic building activity of South Africa strikes one as precarious. South Africa is a rich country, rich in produce in the Cape and Natal, rich in gold and diamonds and recently also steel. It could be as optimistic as the other dominions, if it were not for the dark future the Union is preparing for herself.

Architecture, however, does not reflect that aspect, though it does reflect the cleavage between English and Afrikaans idioms. Nearly all that is worth illustrating here is English, though one of the best architects, H. W. E. Stauch, comes from Germany. His telegraphic address is Bauhaus. Otherwise the move from the relaxed Neo-Cape-Dutch and some Neo-Georgian to the modern style was conditioned by Le Corbusier. The young architects who established the new idiom between 1932 and 1934—a remarkably early date—fervently believed in him and tried to get him out to the Transvaal. They were chiefly the late Rex Martienssen, John Fassler and Norman Hanson.

The Transvaal, that is Johannesburg, has remained the centre of modern architecture in South Africa. Anything prior to 1910 is ancient; nothing at all qualifies seriously for preservation. Flats built in the 'twenties are decidedly old-fashioned. New buildings go up at a startling rate, in the commercial centre as well as in those residential areas in which flats have established themselves. Visual planning is totally absent. The centre is a grid with a minimum of open

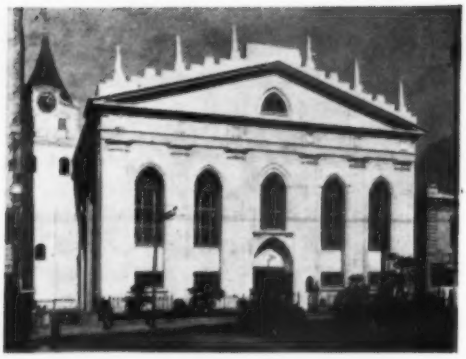
1, Johannesburg from the air, showing the densely built-up centre and the surrounding landscape of spoil-heaps.

2, the shapeless sprawl of new native housing on the edge of Johannesburg: Orlando from the air.

3 (left) aerial view of Cape Province.
4, (below) Central Durban: a typical big-city mixture of period-revival and modernistic.
5, typical Cape landscape of vineyards and mountains: French Hoek valley.

space simply spared out of the grid. The spectacular white mine dumps immediately south of the centre, a great temptation to any visual planner, are left as deserted and barren as mining operations made them. Suburbs extend for miles, the rich ones with lush gardens requiring much care, the poorer with bungalows on small sites. Nowhere can one have the feeling of being in surroundings contrived to make sense aesthetically. Native housing is a disgrace where it is left alone, depressing where it is specially built. The new native estates are reminiscent of prefabs outside English cities hurriedly put up in the war to house the bombed-out.

In spite of the great differences in altitude, climate and population, most of what has been said about Johannesburg applies to Cape Town and Durban as well. The architectural style is on the whole one, though the leading schools of architecture, Witwatersrand and Cape Town, differ a great deal in character. The one is conducted by Professor Fassler, the other by Professor Thornton-White. All that can be said is that the Transvaal offers the most undiluted expression of this South African style. It has to be examined in office buildings, flats, and private houses. In the former two, which can be taken together because both are generally speaking high blocks, two things are striking: the number of architects engaged on them and the anonymity of the results. Young architects get a chance quickly, and a chance that pays. They are nearly all the products of the South African schools, and they have adopted the clipped rhythm established by the buildings of ten years ago. If there is more elaboration, it tends to go jazzy. Sensitivity and delicacy are not the qualities one should look for,



6

7

6, Early Dutch buildings have most strongly influenced South African taste: the Groot Kerks in Adderley Street, Pretoria.

7, a reminder of the days when major buildings were the work of British architects: the Union Buildings, Pretoria, by Sir Herbert Baker.

nor is there on the other hand much of experimental work to be observed. The visual advantages of mixed development, mixed between high and low and between architecture and landscape, have hardly been explored yet. New big office buildings are needed without end, new big blocks of flats find tenants as quickly as they are built, and so they are built, quickly and competently.

Public buildings have no chance in their midst. The vast new railway station at Johannesburg is the one exception. Churches are being built frequently, but hardly ever influence townscape. The Dutch-Reformed churches have a style of their own, patently influenced by a recent romantic trend which one can meet as freely in Holland as in Canada. It is characterized by excessively steep pitches of the roofs and other excessive angularities—a kind of Caligari-Gothic.

The most interesting work at present is in private houses, and the most interesting domestic architect is Mr. Norman Eaton of Pretoria. South African houses are single-storeyed, and they are planned more loosely than those of, for instance, Australia. The principal source of inspiration is no doubt the West Coast of the United States, but the running of houses in a country without servants and a country with plentiful native servants is so different that it is bound to be reflected in plan and elevations. The servants' quarters form part of the whole composition yet must remain separate, and this leads to a variety of solutions worth studying. Apartheid, as it is for cynical reasons not extended to work in mines is also not extended to domestic service. This more than anything shows up the double-facedness of the Nationalist policy and the vulnerability of European civilization in South Africa.

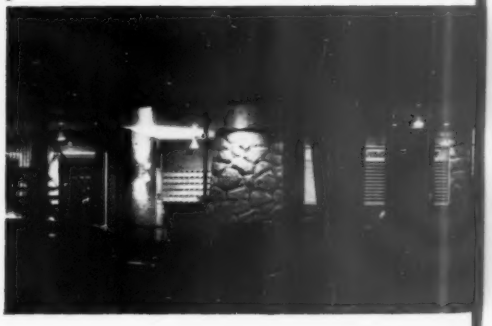
SOUTH AFRICA

Flats, Von Brandis Heights, Johannesburg (architect, H. H. le Roith), description overleaf.

2

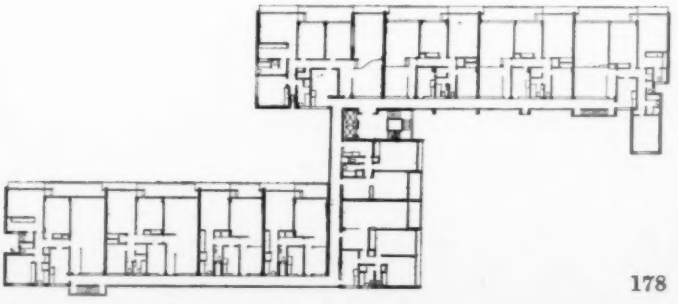
Flats, Von Brandis Heights, Johannesburg (architect, H. H. le Roith), 1 (overleaf), 2 and 3. Advantage has been taken of a steep site, overlooking the city centre, to provide, on the mezzanine, a restaurant and changing-rooms. Above, the living accommodation takes the form of eight floors of bachelor flats and four floors of two-roomed flats. The structure is a reinforced concrete frame supported on the solid rock. To give a greater air of spaciousness to the small flats, glass walls separate the living rooms from the private balconies, while solid internal partitions are taken to door height only, with glass above.

3



4

Flats, Princess Place, Johannesburg (architects, Abramovitch, David, Pinshon and Schneider), 4, 5 and 6 (facing page). The site is of 1¼ acres in one of the old residential suburbs of Johannesburg. The flats are large with several different types of plan. All of them have sliding glass walls between living-room and balcony, and the part of each balcony which extends across the bedrooms is treated as a sleeping porch, screened from view and glare by light terracotta grilles. There are servants' rooms on the roof. General construction is a reinforced concrete frame with brick and glass infill.

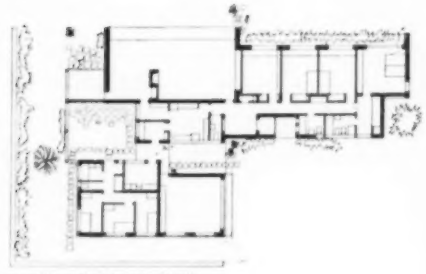


typical floor plan, flats at Princess Place

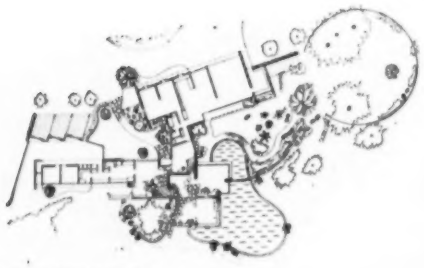
5

6

House, Atholl, Johannesburg (architect, Monte Bryer). 7-9. *On an acre site approximately square in plan, bounded on the north and east by avenues of pine and on the south and west by neighbours' gardens, this house, for the architect's own occupation, consists of two main elements. One contains space for the family's group activities and the other space for the private use of the individual members, designed for living as well as sleeping. North and south walls are of stock brick, colour-washed pale shell-pink; east and west walls are of random kopjie stone.*

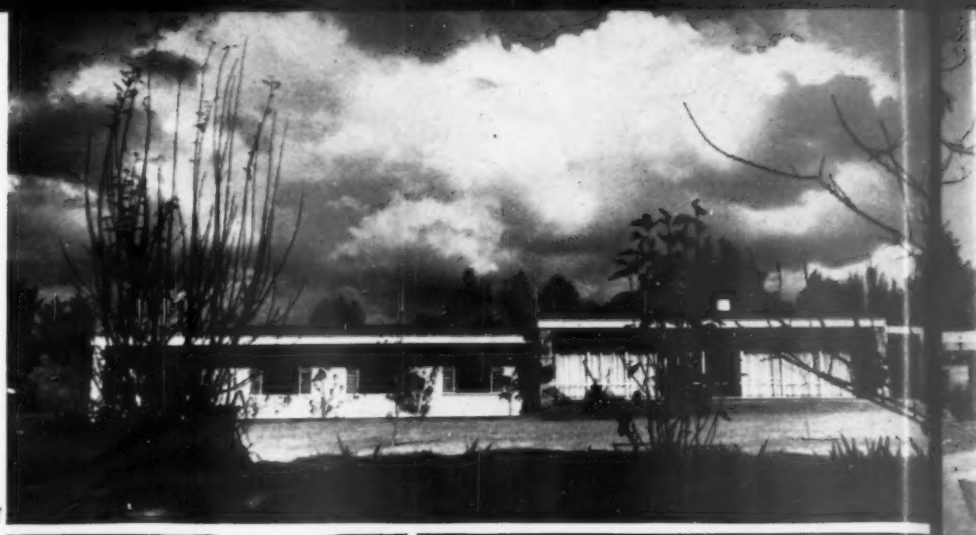


ground floor plan, house at Atholl



site plan, house at Pretoria

House, Pretoria (architect, H. W. E. Stauch and Partners). This house was built by the architect for his own occupation. 10 *shows the raised bedroom wing from the north-west; beyond can be seen the T-section metal struts which support the dining-room roof from the outside.* 11, *the south-east corner of the studio looking north to the courtyard and the upper pool.* 12, *the dining-room from the kitchen door; the raised bedroom block penetrates the glass wall, outside of which can be seen wood flaps that protect gauze ventilators.*



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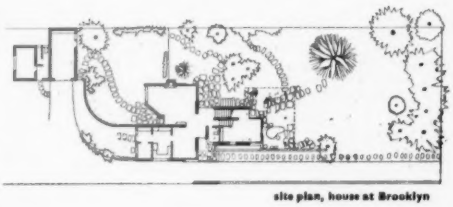
House, Brooklyn, Pretoria (architect, H. W. E. Stauch and Partners). The site is narrow and deep and slopes to the north, from where it is approached. Living-rooms and bedrooms have been arranged in two separate blocks, one behind the other. There is a monopitch roof over the rear block, 13, and this combined with the low link allows a continuous clerestory light which provides the living- and dining-room with the desirable northern aspect, 14, 15. A large outdoor living-space adjoins the study. The brickwork has ruled and whitewashed joints; the first floor is a concrete slab on tubular steel supports; the roof is of corrugated iron and the ceilings of deal matchboard. Living-room floors are surfaced with slate and bedrooms and service rooms with asphalt tiles.

14 15



site plan, house at Brooklyn

16

House, Bramley, Johannesburg (architect, Gilbert Herbert), 16-18. Built by the architect for his own occupation, the house stands in ¾ of an acre on a sloping site. In the planning, separation was made between day and night zones; in the latter a corridor bay serves as a night living and working area. Because of the fall in the ground the living-room is three feet six inches below the level of the dining room. Below living-room and kitchen is a playroom which also serves as a studio for the architect's wife. The house is built of plum-coloured semi-rustic bricks, carrying a flat hollow tile concrete roof supported on precast prestressed beams.

17 18

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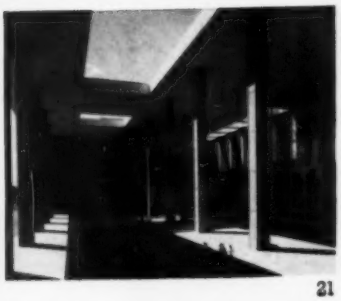

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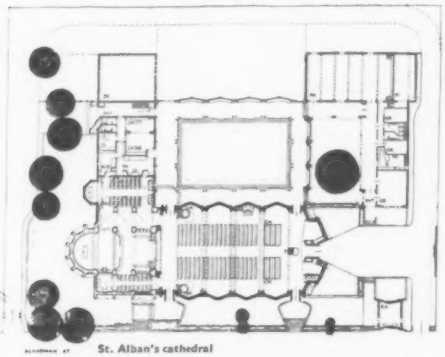
23

Religious Centre, Randfontein (architects, Abramovitch, David, Pinshew and Schneider), 19-23 (facing page). Built in three units round an entrance forecourt, this centre for the United Hebrew Institutions of Randfontein, is set on a five acre site half of which will be used as playgrounds and car park. The synagogue seats 500 with the women accommodated in slightly raised galleries on either side of the centre area where the men sit. The central unit is a large hall equipped for theatrical productions. The third unit is a school with two classrooms, committee room, and an office.



St. Alban's cathedral

St. Alban's Cathedral, Pretoria (architect, E. W. N. Mallows), 25, 26. The Chancel of the church, built to the designs of Sir Herbert Baker in 1909, is incorporated in the now completed church, along with a new chapel which seats 60. In addition ancillary buildings have been provided for both the Cathedral Parish and the Diocese. These include: Sacristies, choir vestries and parish office; diocesan offices; priest's flat; parish hall, two committee rooms, club room and kitchen. A campanile and a deanery will be built later.

24

Church at Alberton, Transvaal (architects, Verhoef Smit and Viljoen), 24, designed for a Dutch Reformed congregation, with an interior incorporating two galleries, a large one to the west, and a smaller one (for Sunday school) at the east, behind the pulpit, which is under the crossing of the roofs. External surfaces are mostly slate, with a narrow window-strip under the eaves, and fixed asbestos louvres in the western gable (seen in this illustration).

St. Barnabas on the Bluff, a suburb of Durban (architect, Leslie T. Croft), 27. For financial reasons the building of the permanent church has been delayed, so the hall, illustrated here, has been designed to serve a dual purpose, with a temporary sanctuary at the west end and the dressing rooms connected with the stage in use as vestries. When the hall is not in use for services, the altar is concealed by a pair of doors which match the panelling on the west wall.

25

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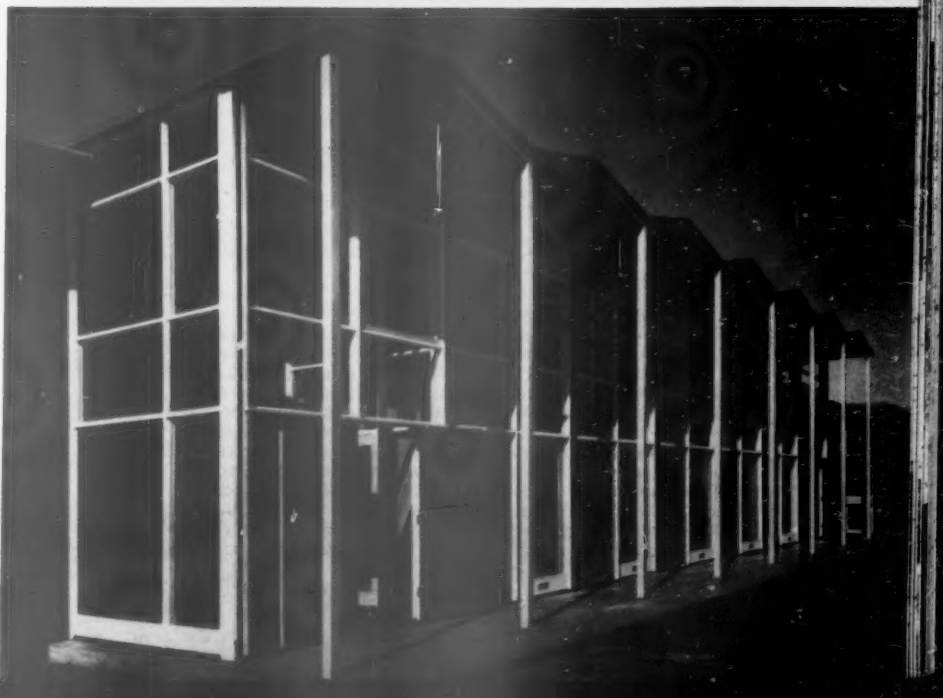

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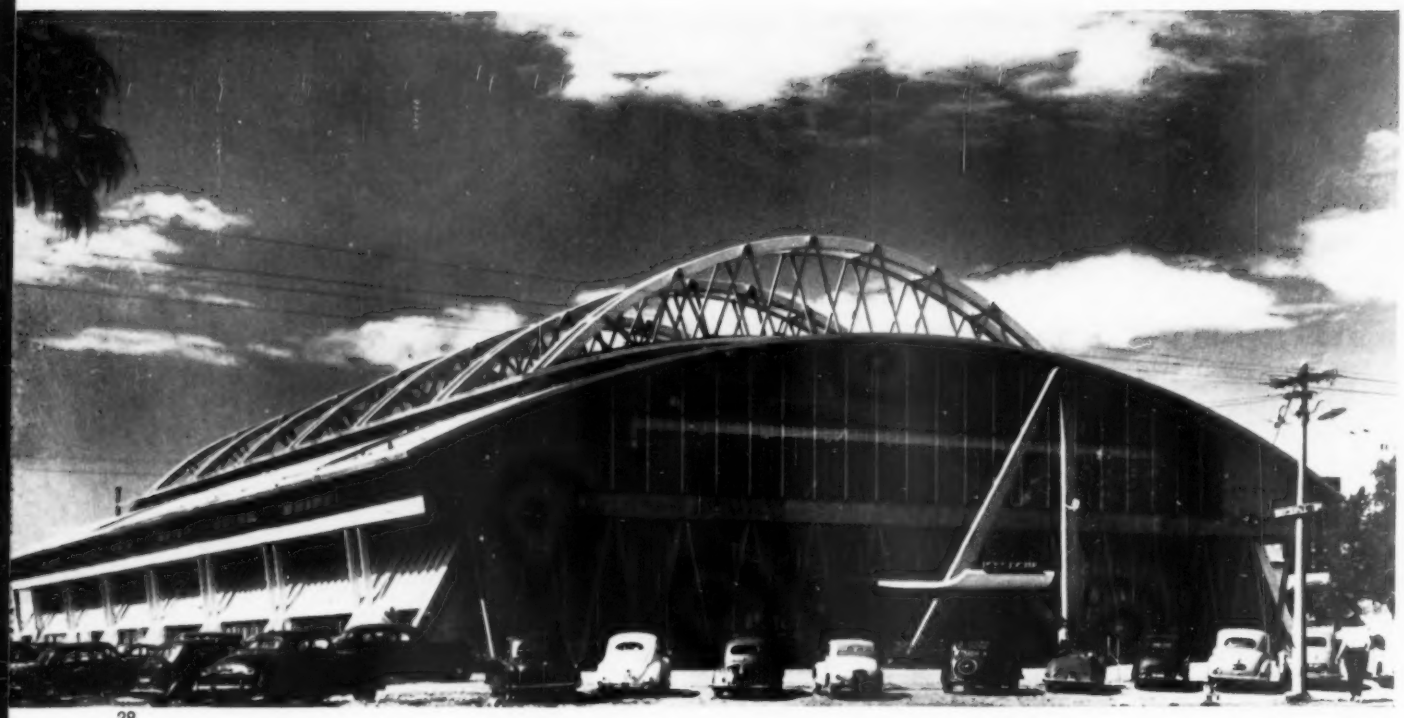

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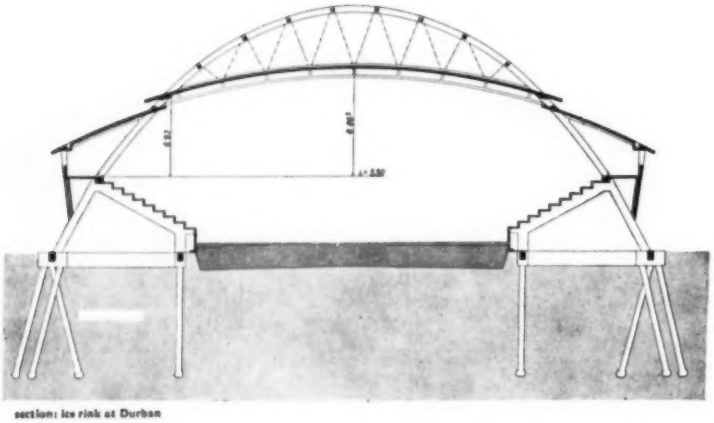


section: ice rink at Durban

Ice Rink, Durban (architects, Hermer and Carrington), 28, situated near the beach with a fluctuating ground water level near the surface, the treatment of the ground under the ice pad needed careful consideration; the whole area was excavated to a depth of 6 ft. and filled with graded gravel finishing with sand below the floor. The area of the ice pad is 185 ft. by 85 ft. and it is surrounded on four sides with stadium-type seating. The twin carrying arches (37 ft. centre to centre of each pair), which are independent of the roof, get their shape from the natural thrust line; they are of reinforced concrete and the arch ribs are 21-in. square in cross section, giving a depth span ratio of 1 in 80; the roof hangs from these on thin steel ropes encased in concrete 5-in. square, the roof itself is of pre-assembled terracotta hollow tiles held together by steel reinforcement embedded in cement mortar. To cope with Durban's high humidity an air-change system supplements the 'chimney' in the roof.

29

Airport Building, Windhoek, South West Africa (architects, W. W. Wood and Partners, 29. An extensible group of terminal and control buildings for the second-busiest airport in South Africa. Stringencies of site-utilization made it necessary to orient the terminal block's air-side façade, seen here, toward the setting sun, which in Windhoek can be very bright, and the necessary sun-control has been effected by adjustable louvres, hand-operated for the restaurant on the roof terrace, pneumatically-operated by a time-switch for the concourse below. The control tower is a separate structure, standing away from the terminal building, but the intervening space may be built over as traffic increases.

30

Science Block, University of Pretoria (architects, Meiring and Naude), 30. The building forms part of a new campus which the architects have designed for the university. It had to have a plan-pattern and system of finishes relating to the other buildings which have since been erected round the campus; each of them had to be of simple and economical design and capable of extension. Sun control in the Science block is by movable asbestos fins; external finishes are of terrazzo, painted plaster and a patent terrazzo wall covering.

31

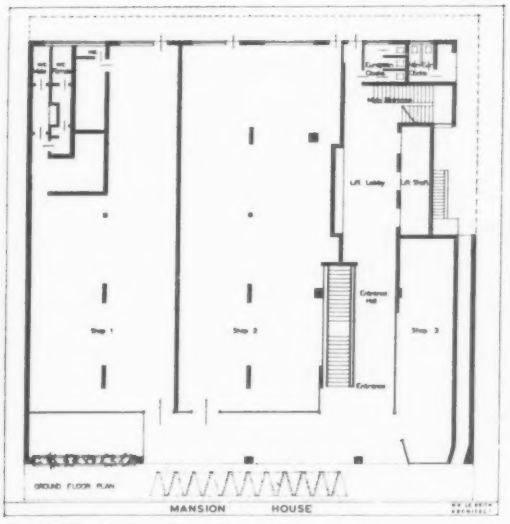
32

Women's Hostel, University of Pretoria (architect, C. Strauss Brink), 31, forms part of a hostel precinct set in parkland; the precinct will eventualy accommodate 800 women students. At present 150 students are provided for in 78 single and 36 double bedrooms; there is a staff of five. The bedroom block with reception rooms, a library, lounge and recreation room and staff quarters on the ground floor, is a reinforced concrete frame structure with hollow clay tile floor slabs; walls are of brick, faced externally with stone chips set in plastic emulsion. Steel windows with adjustable glass louvre casements are set flush with surrounding wall cases. Dining and kitchen blocks have a prefabricated steel portal frame structure, roofed with insulated steel deck.

Headquarters Building, Johannesburg (architects, Charney and Margoles), 32, the seat of the Chapter of South African Quantity Surveyors in the Institute of South African Architects. A complete society headquarters from archive store in basement to caretaker's flat on roof, with bar, lounges, committee rooms, boardroom, and offices for Registrar and secretaries on the two main floors.

33

Offices, Pretoria (architect, C. Strauss Brink), for the headquarters of the Peri Urban Areas Health Board, 33. The Board's functions are municipal with jurisdiction over urban and rural areas in twenty magisterial districts covering 10,000 square miles and controlling urban townships housing over half-a-million Africans. The building contains a rates hall, board and committee rooms, reception areas and office accommodation for 250. The structural frame is of reinforced concrete with brick infill; the external finish is of black stone chips in plastic emulsion, precast white terrazzo grille blocks to cloakrooms and fire escapes; floors are of hollow tile. Windows are aluminium with adjustable glass-louvre casements and baked enamelled steel sunhoods and vertical louvres are fitted on the west elevation.



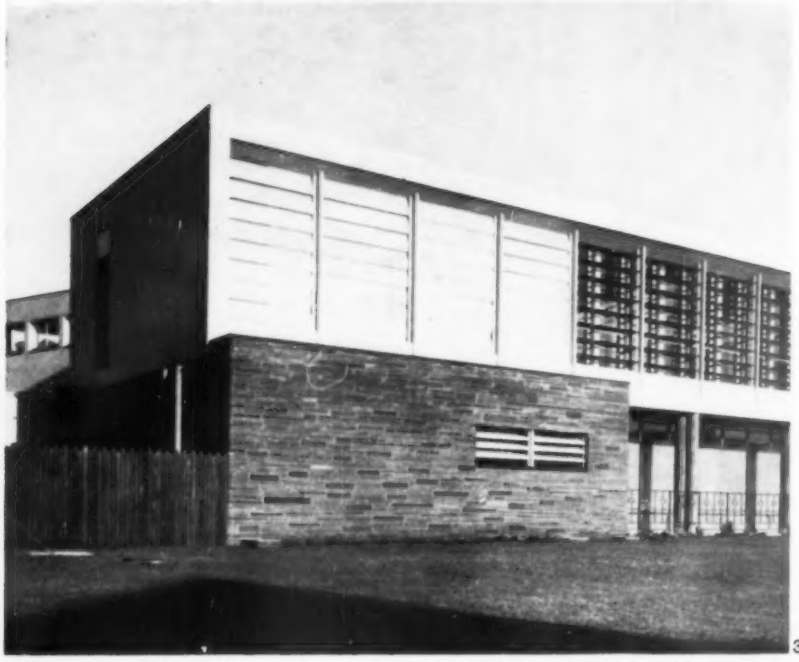
plan of offices at Johannesburg

Offices, Johannesburg (architect, H. H. le Roith), 34. The site is a typical 100 by 100 foot plot in the heart of the commercial centre of Johannesburg. The accommodation is in two wings, planned to permit the maximum flexibility of internal subdivision. The main elevation is faced with three-dimensional baked enamel infill panels.

34

Medical Centre, Cape Town (architects, Tribelhorn and Sons. N. F. Lubynski), 35, forming part of the New Foreshore development—with the van Riebeeck statue in the foreground. This eleven-storey block continues a growing South African tendency for doctors in practice in the larger cities to concentrate their consulting rooms and offices into one building offering a comprehensive, centralised medical service.

35



36

Offices, Durban (architect, O. L. Pretorius), 36, situated directly across the road from an existing rope and matting factory with which they are associated. The building contains a workers' canteen, directors' dining room, a caretaker's flat and a large general store, all on the ground floor; above are offices and a boardroom. A library and a sound-proofed accounting room are at the back. The building is a framed structure designed to carry two more floors at a later date. The west façade has aluminium sun-louvres along its full length; the solid surfaces are all faced with terrazzo with the exception of the entrance canopy and the side wall of the caretaker's flat which are faced with slate.

37

Offices, Sasolburg (architects, H. W. E. Stauch and Partners), 37. These offices for the South African Coal and Gas Corporation are in the form of two two-storey blocks joined by a corridor link. Exterior walls are composed of fins 31 ft. long and 2 ft. 6 in. by 6 in. in section, placed at 3 ft. 5 in. centres; these were pre-cast in one piece and erected by crane. Floors are supported on precast and pre-stressed 'planks' spanning from the fins to the centre corridor columns. The roof is of timber and corrugated asbestos built up on the concrete flat. Movable partitioning is of timber and wall-boarding.

AUSTRALIA

Australian culture is something like a sturdy little boat battling across lonely waters surging with cross-currents from Europe and America. The boat is equipped with a strong thrashing screw but as yet an ineffectual rudder. In the case of modern architecture the three propulsive elements in the culture are conveniently if atypically represented by the three men, all now dead, who struggled to bring the movement to life shortly before the first World War. Firstly, the Englishman, Robert Haddon, a Romantic-functionalist inheriting a little from Morris and Mackintosh: a scholastic man, fond of his new land but always nostalgic for the Old Country. Secondly, the quiet American, Walter Burley Griffin, direct from Taliesin, radiating gentle warmth, organic theory and democratic New World idealism. Thirdly, the Australian, Harold Desbrowe Annear, who was born in Ballarat in 1866 when it was still hardly more than a gold-rush canvas town. Annear never left Australia. He was impatient with such tuition as he could get in Melbourne. He was an experimenter, improviser, inventor of architectural gadgetry. He was self-confident and rebellious. He ridiculed 'good taste' and traditions, preferring what he imagined were his own answers, whatever their faults. He was inconsistent, unstable and not altogether reliable, but among his best works are some which deserve passing recognition alongside the European and Chicagoean pioneers of the movement. (Not that Annear, working in isolation from hearsay and first principles, would have known the others' names or expected recognition outside the smarter streets of Toorak or Portsea where he worked.)

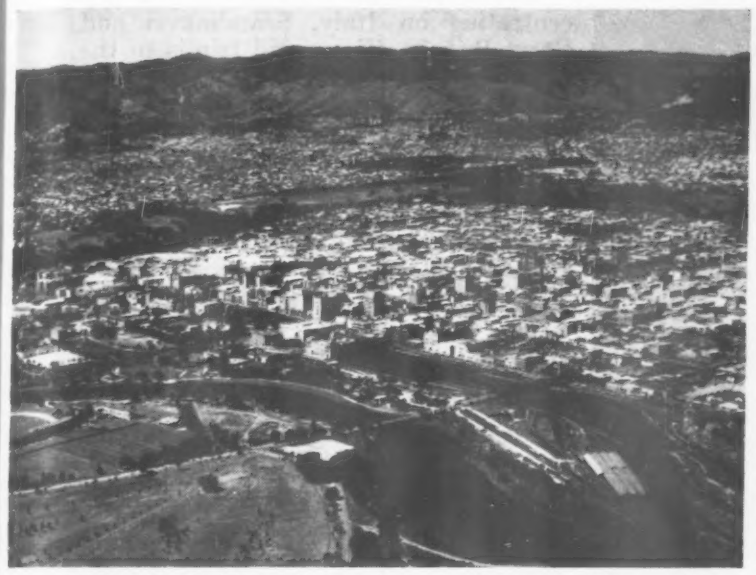
The antipodean isolation has since been modified by radio and jets, but still the three elements are to be found separately, each in a fairly pure state. The Old World is now represented architecturally by a persistent, if slowly shrinking, streak of conservatism

that diverts attention from form to detail. The results of this are never exactly academic, but on the other hand not quite as dowdy as Europe at her stodgiest. The New World is represented by a more than usually hysterical worship of the American image: 'Austericanism,' it has been called. This leads to violent primary-hued delinquency—not clever enough to be fashionably smart, but on the other hand never quite as mad as Miami. The physical isolation of Australia from her spiritual sisters of the West is not in fact felt strongly enough to be valuable. It is not sharp enough to free architects to work out their own solutions. The oceans have worked as a valve permitting only a one-way passage of ideas: inwards always from the higher-pressure areas, continuously inflating feelings of inadequacy or frustration among the local practitioners of all arts. The supremacy of the importation is a popular concept against which the Annear spirit of indiscipline has rebelled at intervals and has produced one vital strain of modern Australian building.

But the average unintrospective Australian architect and his client are not, of course, disturbed by the action of the valve. There is no serious suggestion of aggressive artistic nationalism. Any Australian flavour in everyday building appears to be involuntary, in some obvious ways related to the qualities which visitors usually discover in the Australian human character. He is (observers often say) easy-going to an extent which exasperates urgent North Americans and exact Central Europeans. 'Near enough' is the national philosophy: a deliberate cult of anti-finesse, of outbackmanship. But (they admit) he answers up to challenges. He is resourceful, an ingenious improviser, a born mechanic, the sort of fellow you like to have close by in an emergency. These qualities colour to

2, typical suburban-style houses in the low-density capital city of Canberra.

1, Sydney from the air, showing the spread of the city round the shores of the harbour.



3, Adelaide, South Australia, from the south-east, laid out with unusual foresight in 1836. A belt of parkland separates the centre from the suburbs.

some extent all the styles of Australian building. They help to produce a background that is practical, unstylish, technically advanced, casual in detail and often hideously garish. And they produce the opposite: buildings that recognize the existence of a challenge, of an artistic emergency for a rich and lazy young nation which could quite easily be swamped entirely by imported mass-produced ideas.

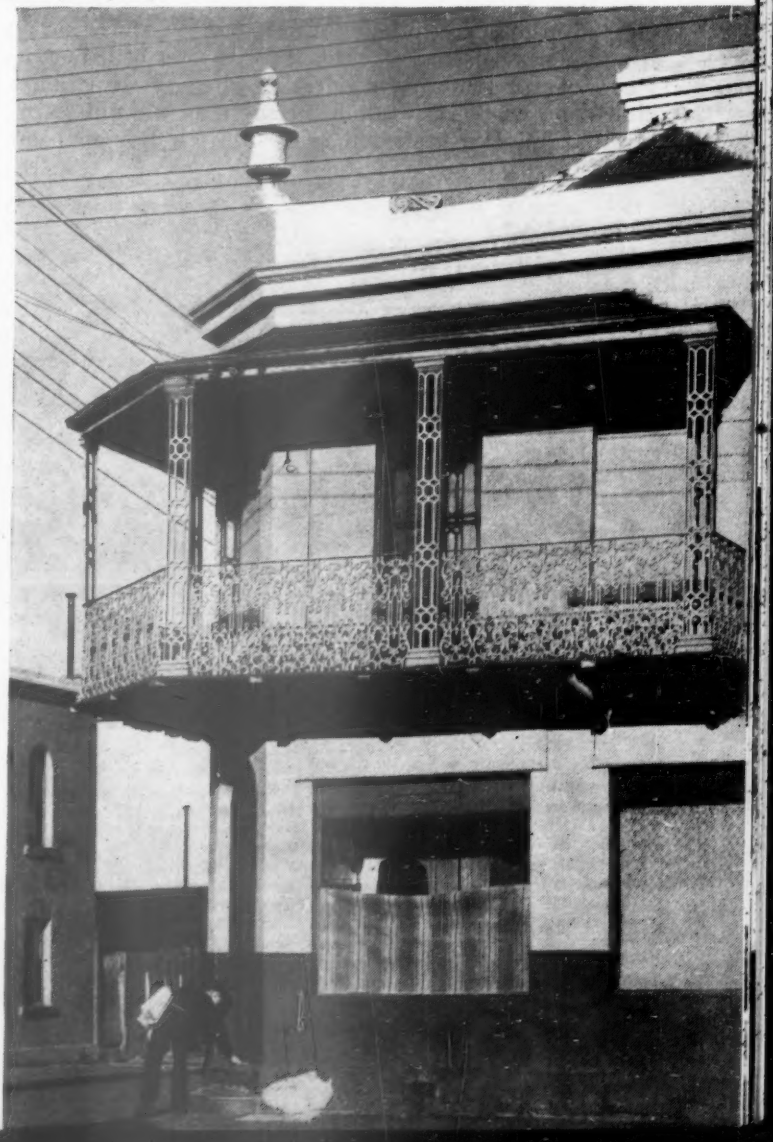
Sensitive Australian laymen, aware of this general danger and searching architecture for a 'National Style,' look hopefully to the colonial building of the early nineteenth century. Here was a displaced, delayed, diminutive Georgian with all the charm of diminution and anachronism and just enough subtle peculiarities to mark it from other and earlier Georgian work. The domestic variant was quite distinctive: a low, hipped shingle roof, later corrugated iron, pulled down all round a white house like a wide hat brim shading the long evenly-spaced windows. Australians can see—though it is less perceptible to visitors—a continuing tradition based on this relaxed and random form. The uncrowded single-storey, wide sun-shading eaves, and extroversion, combined with the peculiarities of the kiln-dried native timbers and the cheapness of Australian steel, still produce in unselfconscious construction a sort of adopted indigenous character.

Australia has many things in common with Sweden and California, including a filial feeling for the twentieth century. Thus a fairly accurate idea of modern Australia may be gained by imagining an underpopulated California. It is hardly surprising that the buildings of both regions have been similar for more than a hundred years. The climate, colouring and social background are similar, and both discovered gold and galvanized iron about the same time. On the other hand Australia may be pictured even better by thinking of Sweden and then imagining the extreme opposite. Australian taste is all peaks and valleys. No landscapes have been outraged more wantonly than the untidy olive and ochre sites of most Australian towns. The first move of the land exploiters still is to remove all trace of native growth. Fevered advertising, frank or subconscious, almost submerges architecture in the commercial areas and every sensitive building is all but smothered by its neighbours. The one architectural vice Australia need not fear is monotony.

But the mess on the surface does not convey the whole activity and gives no indication of the individual soul-searching which accompanies a young nation trying earnestly to know its own mind. If the outrage is wilder than usual so is the outcry against it. Protest and criticism is at least as lively as anywhere, and architecture is a popular art. It is popular because patronage of it is within reach of almost everyone sometime in his life, if not in his business then in the separate suburban cottage often shaped individually for him in defiance of technical advances or business efficiency. The designs of big public projects are widely discussed, architectural criticism is given space in the daily press, and the intricacies of contemporary domestic architecture are a standard butt of television comedians.

The people look to the architect for stimulation and excitement, and at the present time the architects are as uncertain as they are in any other country as to

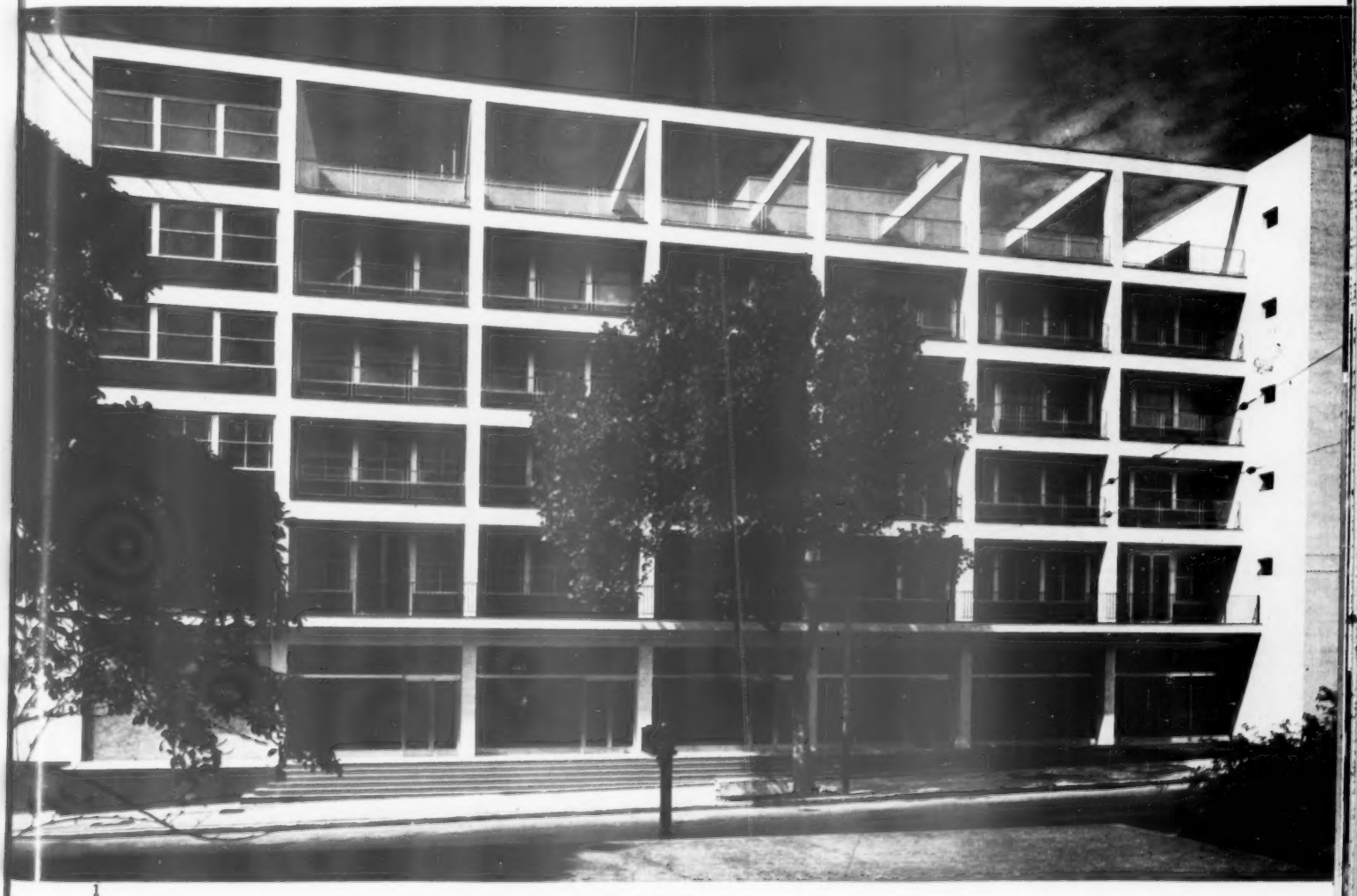
4, among the most agreeable survivals from the past in Australian cities are the examples of rich imported ironwork: a typical roofed and cantilevered balcony in Sydney.



5, Alice Springs, Central Australia, typical of the appearance of low-density towns mostly composed of single-storey buildings.

how they should respond. The younger architect still clings to the faith that there is rational justification for his modern eclecticism. He absorbs the influences of Europe and America separately through the magazines and in travel taken as soon as possible after graduation. His first trip takes him to Europe, concentrating on Italy, Scandinavia and Great Britain. His second trip is to the U.S.A. He is looking for practice rather than theory, and on returning home he finds the *Forum* more helpful than the REVIEW and both more rewarding than any of the local architectural journals. Thus numerous curtain walls are rising in the bigger cities from fifteen towards thirty floors—as clean, conformist and comfortable as ever they were in New York. Then there are Australian versions of all the mid-century mannerisms from Brutalism to Edward Stone, and eager young men who imitate early Wright convinced that they are original, constructive humanists. There are also some quite free-thinkers and those whose first trip overseas is to Japan and Australia's northern Asian neighbours. And there are, finally, those of the Annear spirit: the architectural bush-rangers. It would be fun to think that these last are growing in number, strength and maturity, but the truth seems to be the contrary. The rebels are fading away as Australia gets more populous, prosperous, industrialized and confident. The exciting things in Australian modern architecture were until recently isolated experiments done with little more than sticks, wires, space and unencouraged enthusiasm. But already the last continent is losing its innocence.

AUSTRALIA



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Anzac House, College Street, Sydney (architects, Bunning and Madden), a five-storey office building serving as headquarters for returned soldiers' organisations and as a memorial for two world wars. It was the result of a competition held in 1948. The ground floor contains an auditorium seating 350, a large foyer and a war-memorial hall. Above are offices either side of a central corridor on an L-shaped plan. Balconies 5-ft. deep provide shade on the west façade. The structure is steel-framed with reinforced concrete floor and roof slabs. External cladding is travertine with grey terracotta panels under windows. 1, exterior, 2, the memorial hall, 3, auditorium.

Office building, Sydney (architects, Stephenson and Turner), the headquarters of Unilever in Australia, 4 (facing page), in Macquarie Street, between Government House and the harbour, and the last large building before Benelong Point, the site of the future opera house. It is a 16-storey rectangular block with its two long faces slightly curved. Services and lifts are concentrated at the southern end, leaving the remaining floor-space free except for one staircase near the north end. The floors are cantilevered outwards from two rows of reinforced concrete columns. The glass panels between windows being etched on the inside to match the floor-slabs. No windows open, the building being air-conditioned by four plants which can be separately operated to deal with the irregular concentration of sunshine on the four façades.

Office building at Melbourne (architects, Bates, Smart and McCutcheon), 5 (facing page), the Australian headquarters of Imperial Chemical Industries; an 18-storey block at the eastern end of the city. Above ground the building occupies less than half the site area, leaving room for a garden and car-park at ground level, but the whole site is excavated to provide two basements containing stores, services and a 65-car garage. Construction is lightweight steel frame with curtain walling of aluminium and blue-grey, heat-toughened glass. The building is fully air-conditioned.

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Insurance offices, Sydney (architects, Peddle, Thorp and Walker), 6, for the Australian Mutual Provident Society: a 26-storey block (the tallest in the city) in Sydney's ancient Circular Quay area, dominating the waterfront. At ground level there is a large public area sheltered by the overhanging first floor. The ground floor contains an auditorium seating 260. Car-parks are in two basements. The air-conditioned office space is uninterrupted by columns.

Office building, Miller Street, North Sydney (architects, Stephenson and Turner), 7, an 11-storey block for commercial letting with lock-up shops on the ground floor. The office space is planned round a central service core and is air-conditioned. The structure is steel frame with concrete slab floors giving flush ceilings. The east façade consists of an aluminium curtain wall with fixed windows and porcelain enamel panels. The other three façades are in light coloured brickwork with continuous aluminium windows.

Insurance offices, Adelaide (architects, Bates, Smart and McCutcheon; associate architects, Lawson, Cheesman and Doley), 8: for the Mutual Life and Citizens' Assurance Company. The building overlooks a large city square and is set back on its side to admit daylight on three sides. It is air-conditioned to a special design to meet the high heat-loading on the long east and west façades. It has a lightweight steel frame, steel deck floors and fire-proofing of lightweight concrete. Curtain walls are of glass in aluminium frames with aluminium brise-soleil.

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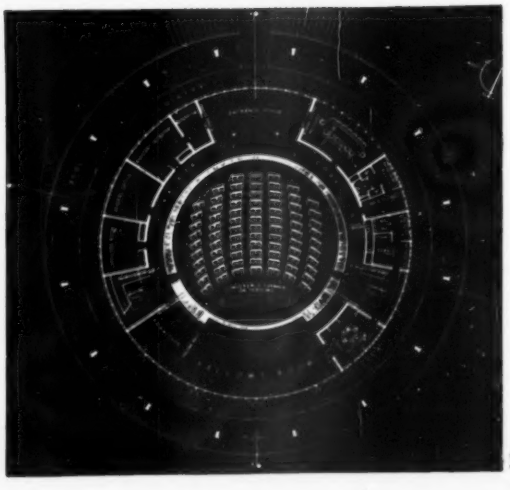
Academy of Science building, Canberra (architects, Grounds, Romberg and Boyd), 8-12, a headquarters for the representative body of Australian scientists. The circular building contains a conference hall, reception rooms, reading room, exhibition gallery and offices. The air-conditioned conference hall, 64 ft. in diameter, is in the centre, with the other accommodation arranged on two floors round it, separated by a circular corridor on the ground floor. The main entrance and foyer are at the north and the large Fellows'-room at the south. The overhang of the dome shields the windows from direct sunlight. The structure is monolithic shell concrete, 3-in. thick, resting at sixteen points on a concrete ring which forms the base of a water-filled moat surrounding the building. The dome is sheathed in copper.



11, 12

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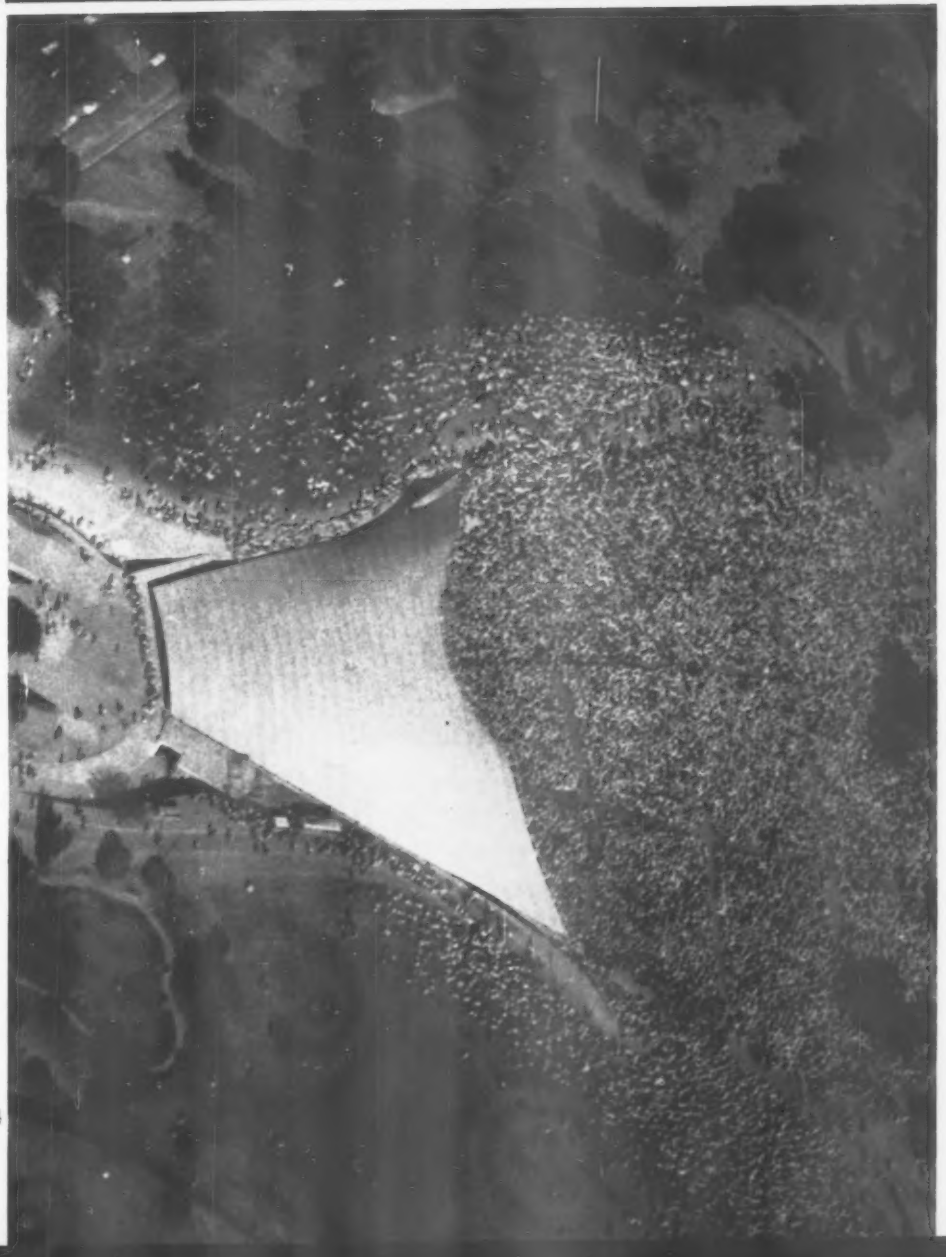
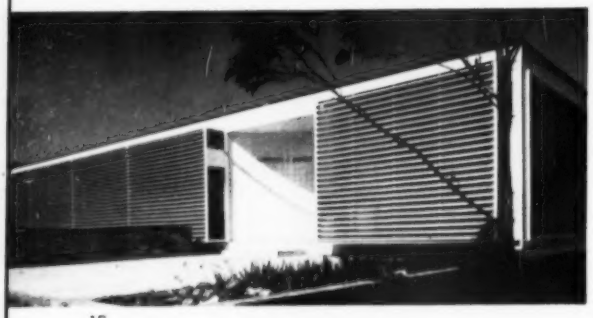


14

Music bowl, Melbourne (architects, Yuncken, Freeman brothers, Griffiths and Simpson), 13, 14. The roof, which covers stage, orchestra and the front rows of seats, was not designed primarily to give shelter but to deflect the sound of nearby traffic. It is supported by twin steel masts, cased in glass fibre with ball-and-socket joints at the foot to permit movement. The main cable passing over the tops of the masts is 568 ft. long and weighs 40 tons. The roof-covering is ¼-in. plywood, faced with aluminium, bolted to secondary transverse cables. The joints have polythene and nylon washers to suppress sound caused by movement of the structure. Dressing-rooms are fitted in below the stage.

Factory offices at Lane Cove, an outer suburb of Sydney (architects, Edwards, Madigan and Torzillo), 15. The offices occupy the main ground floor with staff amenities in the basement. They are steel framed on a reinforced concrete raft slab with timber roof covered in asbestos felt and aluminium foil.

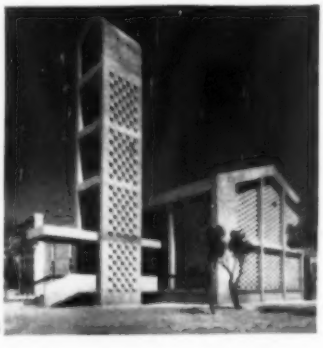


15

Wilson Hall, Melbourne University (architects, Bates, Smart and McCutcheon), 17, 18, used for conferring degrees and other university ceremonies. It replaced a Gothic-style hall burnt down in 1952. The main floor seats 1,000, with a further 300 seats in a gallery sloping back over the entrance foyer. Construction is steel frame: the eastern wall heat-absorbent glass in aluminium framing; the other walls largely brick.

Olympic Pool, Melbourne (architects, Borland, McIntyre, Murphy and Murphy), 19, built to house the swimming and diving sections of the 1956 Olympic Games. 6,000 spectators can be accommodated on two tiers of seats whose outward-sloping beam-supports are tied together across the pool by diamond-shaped roof trusses—the only external structural elements are stabilising guy-rods.

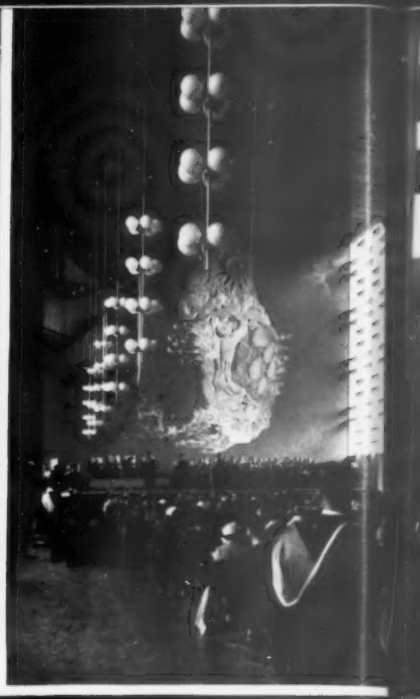
Church at Dalkeith, a suburb of Perth, W.A. (architects, F. G. B. Hawkins and Desmond Sands), 16. It seats 340. The floor of the nave has a slight slope to improve sight-lines. Walls are brick and concrete and the roof steel and timber covered with tiles.



16

Restaurant at Dalkeith, W. Australia (architects, Forbes and Fitzhardinge), 20. It is covered by a domed roof in shell concrete, supported at three points forming an equilateral triangle with 61-ft. sides and rising to 16 ft. at the crown. The shell was poured continuously in ten hours. The underside of the dome is sprayed with asbestos. The restaurant and outdoor terraces together seat 40, and adjoin a swimming-pool.

17



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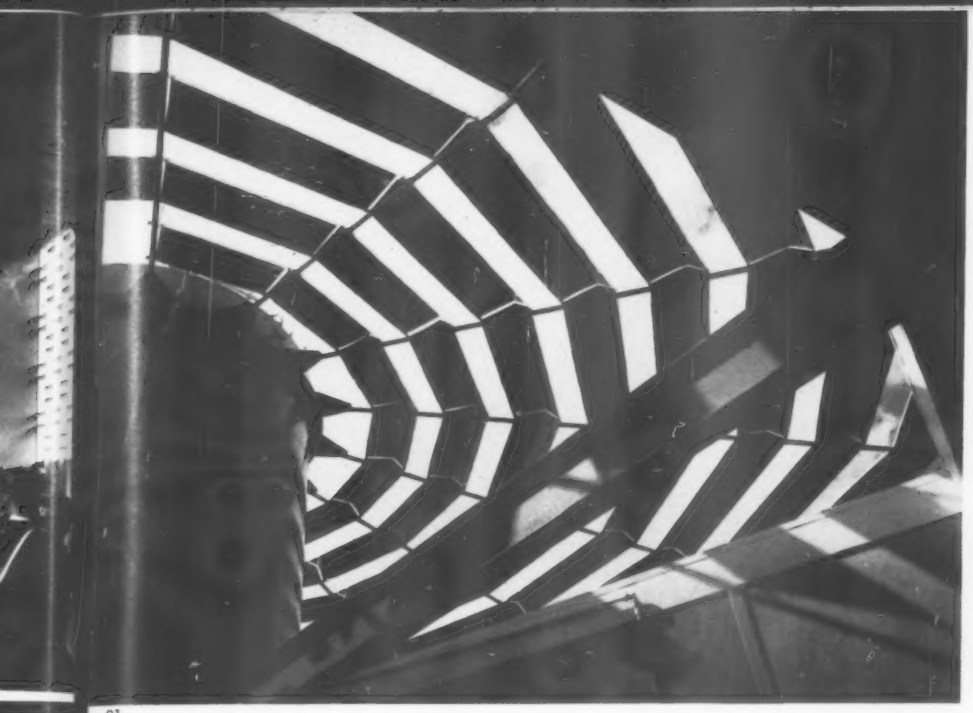
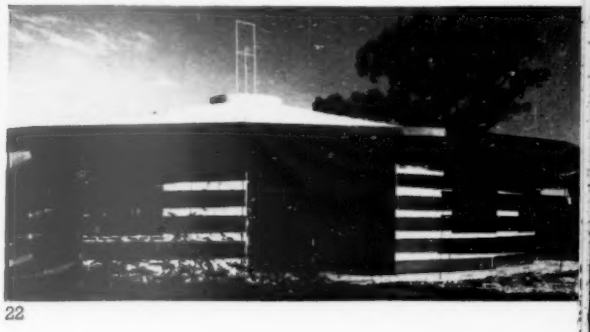


21

Bush Hospital, Beulah, Victoria (architects, Peter and Dione McIntyre), 22, a small, six-bed hospital designed for almost desert climatic conditions. The structure is designed around the central mast supporting the rain-water tank, from which also radiate the aluminium slats of the umbrella-shaped false roof, which protects the main roof from sun-heat yet permits air to flow over it. Aluminium slats also shade the side walls, with a four-foot air-space between walls and slats, 21 shows the construction of the roof louvres from the "service court" in the centre of the building, with the rain-water tank on the left.



22

House at Turramurra, N.S.W. (architects, Archer, Mortlock and Murray), 23. This is a typical bush-land site on Sydney's fashionable North Shore and the house is designed to fit into the natural landscape as unobtrusively as possible.

23

House at Wahroonga, N.S.W. (architects, John Allen and Russell C. Jack), 26, for the latter's occupation. The site is rock-covered and heavily wooded with eucalyptus trees. A small watercourse crosses it diagonally. The house has a timber-framed structure with twin columns supporting main beams at floor and roof level. Internal and external brickwork is painted a sand colour; other internal and external walls are vertical mahogany boarding. Windows are Queensland maple.

House at Templestowe, Victoria (architect, Kenneth McDonald), 27; a small hillside house for a doctor and his wife and occasional guest, planned round a central service core with internal bathroom lit and ventilated through a window above roof level. Construction is timber and brick with roof covering of aluminium foil.

House at Pymble, N.S.W. (architect Harry Seidler), 24, 25 (facing page). A sloping 3-acre site with a view to the south determined the split-level plan with superimposed living and bedrooms both facing the view. The single-slope timber roof has a white mineral surface visible from the approach side. Walls are brick or local sandstone with extensions acting as retaining walls and giving privacy to outdoor spaces. Floors are flat concrete slabs. Living rooms are lined internally with vertical timber boarding. The house has underfloor electric heating.

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House at Vermont, Victoria (architect, Kenneth McDonald), 28; a low-cost house of 900 sq. ft. for a couple with one child. Sited among gum-trees to make the most of distant mountain views, it has an open living area, completely separated from the sleeping sections. Construction is largely timber with roof covered with aluminium foil. Internal walls are cypress pine running vertically.

House at Roseville Chase, N.S.W. (architect, Maurice Morrison), 29, 30. Sited in a natural hollow, back from the highway, with views in the opposite direction, the living-room therefore facing north and east over a pool. There are two bedrooms. It has a steel frame resting on a concrete floor-slab suspended over the rocky slope. Walls (non structural) are concrete externally and painted plywood internally. Ceilings are boarded. The bathroom is top-lit.

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Flats at Toorak, Victoria (architects, Grounds, Romberg and Boyd). This development in a suburb of Melbourne comprises four flats and a house for Roy Grounds. The flats, 31, 32, are

32

built down the slope of a hill and are planned to provide privacy. The living-room of each flat faces on to its own enclosed courtyard. The architect's own house, 33, 34, is square in plan with a circular courtyard in the centre. Construction is load-bearing brick, concrete slab floors, which are heated, and timber framed flat roofs. Window sashes are aluminium set in a structural frame of Victorian mountain ash.

34

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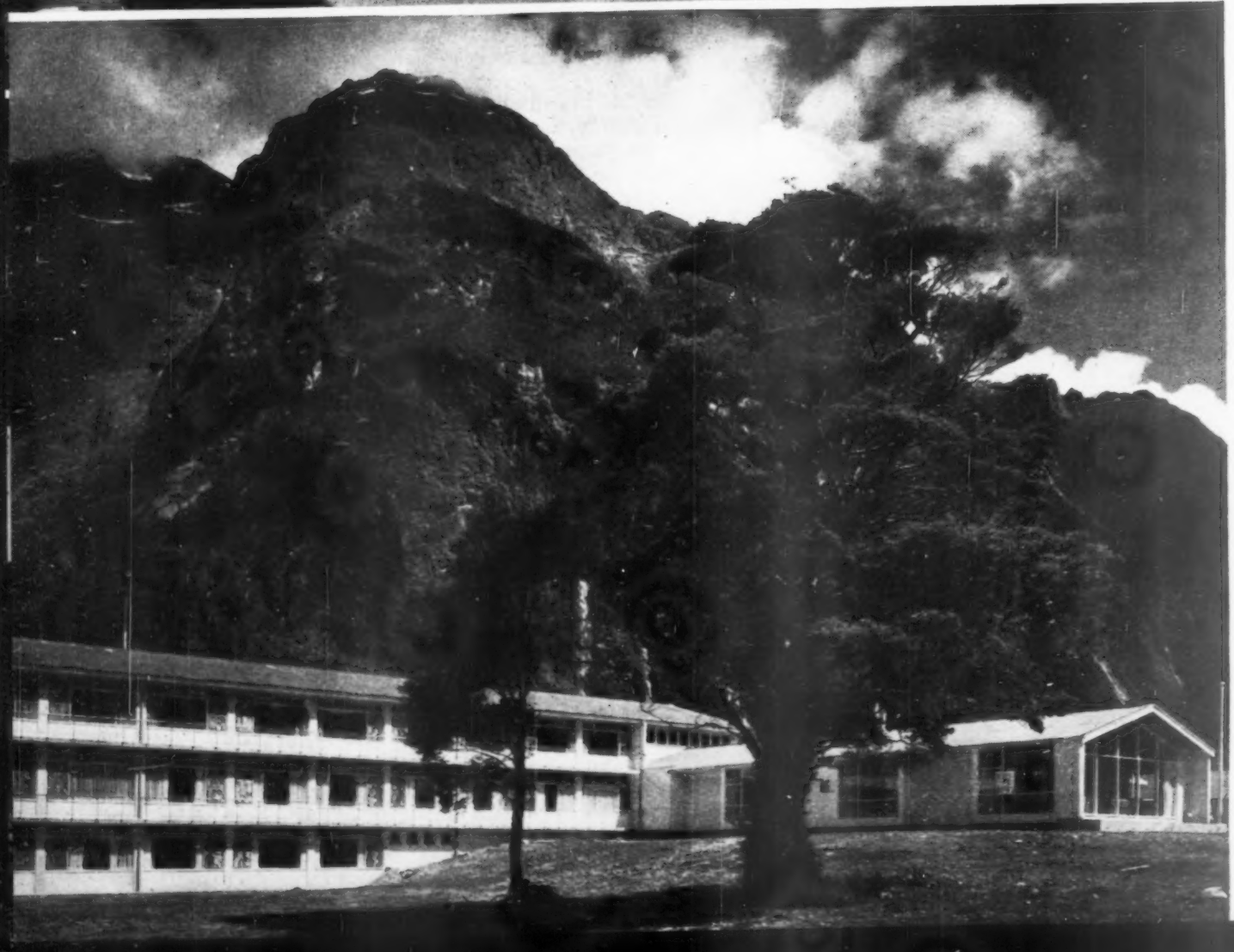
NEW ZEALAND

New Zealand is one-thirtieth the size of Australia; but that figure is deceiving; for whereas Australia has immense wastes within her boundaries, New Zealand is on the whole cultivated throughout, even if Central Otago carries only one sheep in every five (and sometimes ten) acres. The country lives on agriculture, cattle-breeding and sheep-rearing, and it lives comfortably on that—comfortably in the sense that everyone has enough and few have too much. There are no riches and there is no poverty, and there is a welfare organization only matched in Britain, and certainly of longer standing than in Britain. All these conditions find their reflection in architecture. Climatic differences are curiously little represented, although the range goes from areas of sub-tropical rain forest by way of moderately rainy areas much like England and Scotland to alpine and fjord areas. The bush is not what it is in South Africa; it is dense growth of forest, with or without tangled undergrowth according to latitude. In the forests down in the south-west corner of the South Island, south of Milford Sound, there are still unexplored patches. But mostly the countryside is inhabited, sparsely, of course, and houses—except for some small Maori holdings—are clean and well looked after. Urban population amounts to over 40 per cent, if inhabitants of towns of over 100,000 are called urban. There are no slums; there is only overcrowding of the same small, not at all neglected, bungalows which, not quite so densely sited, make up other suburbs as well. New houses are bungalows almost without exception. They are of timber, with a veranda, brightly painted and as a rule as innocent of architectural values as are spec-builders' houses at home. But they are never imitation-Tudor, or indeed imitation-anything, except, of course, imitation-modern-clichés. If they could recently be called an 'ingratiating chaos' (Pevsner)

1



2

the adjective refers to their appearance individually, the noun to their siting and placing. There is no town-planning worth speaking of, either in central or in suburban areas. In central areas in fact there is none, in the suburbs the Government Architect has occasionally tried to group bungalow housing by means of winding streets into a kind of garden city pattern (Hutt near Wellington). But the bungalows, his building components, defeat him. Auckland, the largest town, is only the size of Nottingham. Wellington and Christchurch correspond about to Aberdeen; Dunedin is no bigger than Luton.

Everybody wants a house of his own, and after a few years the new immigrant can afford one. New blocks of flats are exceedingly rare and almost exclusively built by the Government Architect, either in groups of three and four storeys, or here and there in high slabs looking as well as most of their European patterns. Of these high slabs one was built at Wellington before the war; a second at Wellington and one at Auckland, both taller and more exciting in appearance, are recent.

High buildings are all but absent in the centres of cities too. Auckland has one slab of Government Offices recently completed, and Wellington is going to have a fifteen-storey point block of Government offices for which excavations are going on. That is all. It is perhaps the most characteristic feature of the architectural situation in New Zealand that the Government Architect's Department is responsible for nearly all the major work in the country, and that in addition the department, under its head, Gordon Wilson, who died prematurely a few months ago, represented the spearhead of modern enterprise instead

4, Wellington, the capital: looking across the busy commercial centre to the distant encircling hills.

of being safely in the rear as one would expect in Europe and as is, for instance, the case in South Africa. Office buildings which fall to private architects are never as big as they can be in Australia, nor are factories. The biggest office buildings were built between the two wars and are a minor variant of American manners. Of work of the last few years Mr. Plishke's Massey House at Wellington is an exception in scale as well as careful detailing. The same applies to Mr. Plishke's house for Dr. Sutch, an exception in New Zealand private houses. This loving pursuit of the refined detail may well be the architect's Viennese heritage.

Most of the other modern architects are New Zealand-trained or have gone through English or American schools. Those who have not, try to travel, but scholarships and grants are too costly to be possible and private travel naturally even more so. The respect for England is great, and emotional ties are as a rule admitted, but the relations are platonic. The majority of the work of the younger architects is small private houses of timber, and for these England has nothing to offer. Looking across the Pacific pays better, and Californian houses in the journals are pondered over with more profit than English ones. A good deal of ingenuity goes into planning, and this ingenuity is needed; for the client is never rich. In England without any doubt he would buy himself an old house and redecorate it; he would never be a client. Old houses in New Zealand have not yet acquired a period value. Preservationism is completely absent; too much so, one is inclined to say. Apart from such historical monuments as Maori meeting houses,

1 (facing page), Dunedin, showing typical period-style architecture that provides the setting for modern building: on the left the railway station; on the right the police station.
2 (facing page), an hotel by the Government Architect at Milford Sound, seen against typical rocky, well-wooded scenery.
3, below, small brick and timber houses perched among the hills containing the suburbs of Wellington. In the foreground is a house by Anthony Treadwell.

3

5, Wellington: Government housing introduces a new scale into a typical residential scene composed mostly of two-storey dwellings.

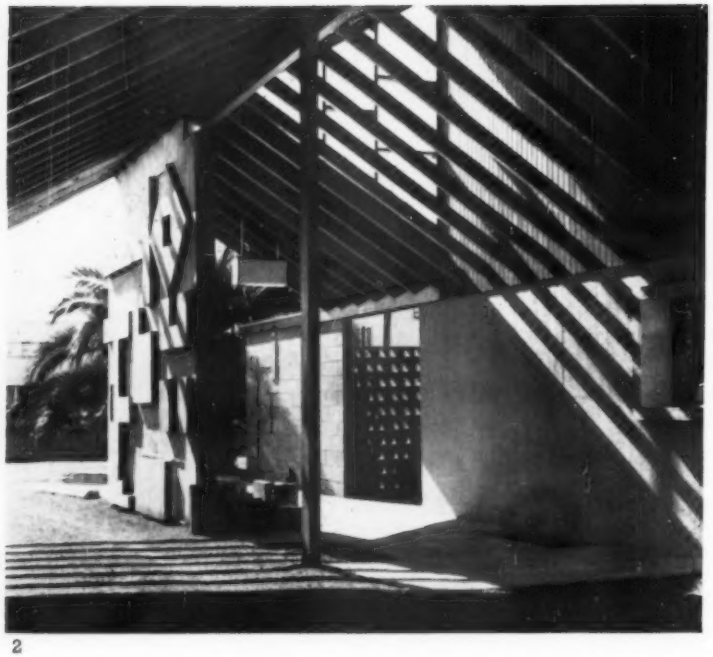
some Maori Christian churches and the early mission buildings of Bishop Selwyn nothing is accepted as worth keeping. None of the extremely pretty farmhouses surrounded by verandas with fretwork or cast-iron trim is excepted. So architects have work, but they don't grow rich on it. Lack of means is often apparent in the detailing although a certain crudity is called straightforwardness and, at least by some of the most thoughtful young architects, set up as a new-country feature in opposition to the old-men's fussiness at home. It sounds convincing at first, though California is not all that old and yet is quite capable of taking its details seriously.

Of public buildings, schools and universities are usually served by the Government Architect. Several major jobs are in course of construction, such as the Dental School at Dunedin and the Department of Engineering at Christchurch. Some of the new hotels of the semi-governmental tourist organization on the other hand have been handed on to private architects. Those at Milford Sound and the Hermitage just in front of Mount Cook, the highest mountain of New Zealand, are excellent jobs, light and fresh and well furnished and perhaps more inspired by Italy than by America. Inspiration from England in this field is, alas, out of the question. The new airport at Christchurch is also privately handled, by Mr. Paul Pascoe, and promises equally well. Ecclesiastical work is on the whole disappointing, except for the famous pre-war chapel of Waiho, where the Southern Alps behind a glass wall make an unforgettable reredos, and its progeny, and except for Mr. McCoy's Roman Catholic buildings in Otago and further south.

There is only one school of architecture in New Zealand, at Auckland. It has recently established a town-planning department, with English staffing. The department is going to have an uphill fight. Physical planning is a latter-day activity. It is also a matter of subtlety. Pioneers don't need it. It follows after you have settled down for good and accepted conditions as stable. This not even the United States has done yet, if one excepts road planning which is not town-planning. How could it have established itself in New Zealand, where the countryside is vast in comparison to population and the towns are without exception not vast? So town-planning would be primarily visual planning, and visual planning would be viewed with misunderstanding and even suspicion by the laymen and might well be looked at by architects themselves as an old-man's game just as much as sensitive detailing.

Flats, Auckland (F. G. F. Sheppard, Government architect), 1, facing page. The site is in Auckland city and the building, which has 89 flats (75 two-level, two-bedroom maisonettes and 14 bed-sitting rooms on the ground floor), is of reinforced concrete wall and slab construction, without beams or columns. The use of concrete for domestic work is new to New Zealand, and great trouble has been taken in these flats with the use of fairfaced concrete to provide a smooth finish with true alignment and free from blemishes.

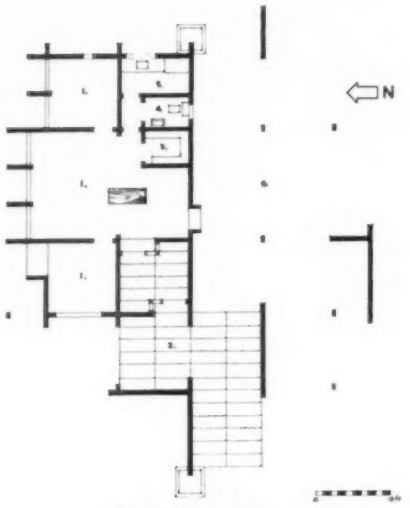

NEW
ZEALAND



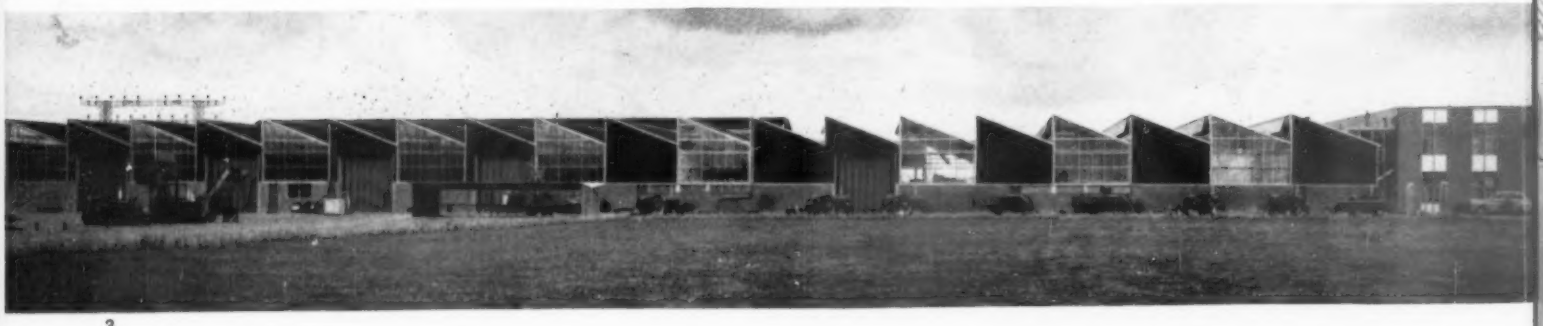
2

Showroom, Napier (architect, Maurice Smith), 2, a complex structure for a concrete company, housing offices and services at one end and becoming (without any defined point of transition), a display of materials and techniques at the other. The part illustrated, while largely a display structure also serves as a car-port, and the flooring is 'on view' as well as in use.

Brewery, Palmerston North (architect, Ronald J. McMillan), 6 (facing page). The Brewery tower is one element in a group of new structures which are gradually replacing an existing brewery. The influence of seismic loading on the structure with respect to large liquid masses together with the combined effect of soil pressures were major considerations in the design. Two elevations are complete glass curtain walls, one of which hinges open for maintenance work; glazing bars are white with centre mullions of stainless steel; surrounding frames are terracotta and the remainder of the exterior is pale green. 6 →



plan of concrete showrooms



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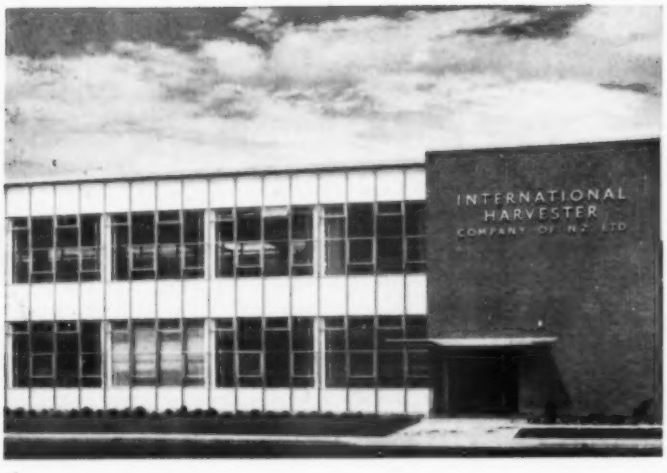


4

5

Offices, Christchurch (architects, W. H. Trengrove, Trengrove and Marshall), 3-5. This office block and warehouse for the International Harvester Company consists of three basic units; a crane bay housing a 15-ton crane and a south-lit sawtooth structure, 3, housing the assembly and parts department, both of steel frame construction; a two-storey block of executive and administrative offices, 4, 5, which has a reinforced concrete frame with brick veneer and panels except to the front which is aluminium curtain walling with white glass infill panels. The entrance canopy fascia is stainless steel and the entrance doors are armourplate glass. Central heating is by convectors which form an integral part of the window design.

House, Wellington (architects, Plishke and Firth), 7, 8 (facing page) and 9. On a steep hill overlooking Wellington Harbour, planned on different levels in order to get the maximum benefit from sun and view. Courtyards and terraces are closely related to the living areas to provide outdoor living protected from the wind. The structure is a wood frame; the dark stone for the east terrace was brought 500 miles from Auckland, while the golden sandstone which paves the patio and continues into the gallery and hall, 9, was brought 2,000 miles by sea from Australia.

7 ← 8

9

House, Queen Charlotte Sound, near Picton (architects, Porter and Martin), 10. A holiday house built on a slope in a cup of the hills. The section follows the slope of the hill, making possible a boat-shelter on the lower level. The external sheathing is of vertical shiplap pine boards which were run through boiling tar oil before being fixed; living room walls are covered with the same boards with a satin clear varnish.

10

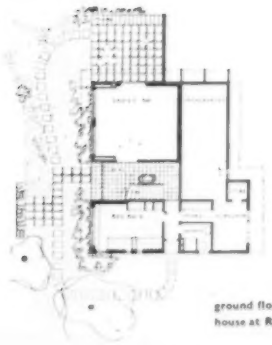
Demonstration house, Titirangi (architect, Gerhard Rosenberg), 11, built to demonstrate economy in the use of timber, of which about 2,500 board feet are used, and the value of some new structural ideas and materials. The outside is of block veneer which takes care of earthquake stresses, leaving the framing to carry only the roof load. The roof has exposed rafters of Oregon pine.

11

12

13

Flats, Dorset Street, Christchurch (architect, F. M. Warren), 12, 13. The building comprises eight flats, four on each floor. The four ground-floor flats each have their own private garden surrounded by high walls. Walls are of load-bearing concrete block, painted white inside and out; the roof is timber-frame covered with corrugated iron, with ceilings following the pitch of the roof. Heating is by free-standing Norwegian stoves, set on quarry tile bases.

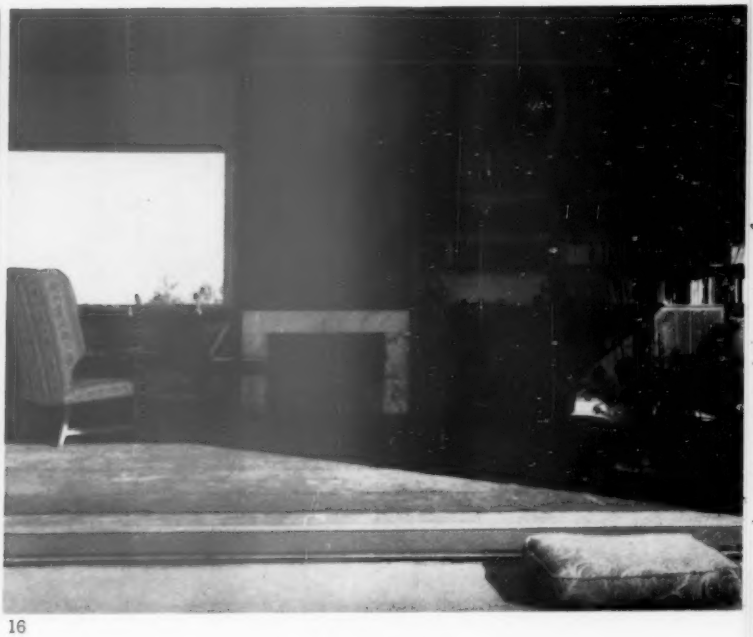


ground floor plan:
house at Raumati

House, Raumati (architects, Plishke and Firth), 14. This house, of 2,000 square feet, has separate bathrooms for parents, boys and guests, a factor above the average in standard for New Zealand, though in view of the lack of domestic help, the highly-mechanised kitchen is not. Timber is used for the structure since it provides greater elasticity in case of earthquake. The system of electric ceiling heating was used here for the first time in New Zealand.

14

15



16

House in Belmont (architects, Plishke and Firth), 15, 16, an L-plan villa with provision for enlargement at the back of the bedroom wing (see plan). All the main rooms face on to a paved court to the north-west, the sun-trap orientation for New Zealand.

plan: house in Belmont

17

House, Milford, Auckland (architects, Juriss, Penman and Wilson), 17. On a flat site 100 yards from the beach, the house was designed for a yachtsman owner with two children. The exterior walls are of hollow concrete block painted inside and out. Waxed matai ply is used for furniture and panelling. Roof framing is all of Oregon pine. Heating is by a coke-burning space-heater.

House at Wellington (architects, Gabites and Beard), 18. Situated on the bush-clad slopes of Mount Johnston, it was initially built up on columns and bracing walls and occupied on the upper floor only; as the family has grown the bedrooms below have been put into use. The structure is of Douglas fir posts and beams, bolted with Heart Rimu floor joists, Pinus Radiata ceiling joists and sarking and Heart Matai decking. Weatherboards are red stained and oiled, with black painted vertical facings and window frames and fascias painted white. Inside there are Pinus Radiata close-boarded ceilings with a clear finish, the beams and columns of Douglas fir are stained red.

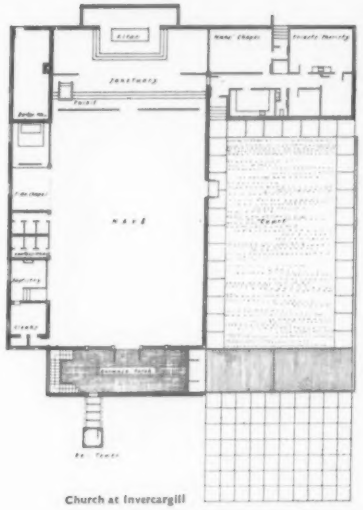
18

19

Offices, Wellington (architects, Plishke and Firth), 19, 20. Built for the New Zealand Government Boards for meat and milk, which represent the main industries in New Zealand, apart from that of wool. The building, facing Lambton Quay, is seven storeys high. The structural framework has been kept free of the enclosing curtain walls which have deep mullions to give texture and depth to the façade. A curved wall in the Dairy Board room is panelled with totara burr veneer, obtained from the root of the now rare totara tree; it is made up of 390 individual pieces. The photograph on the right is a detail at the head of the main stair and the lift machine house on the roof.

20

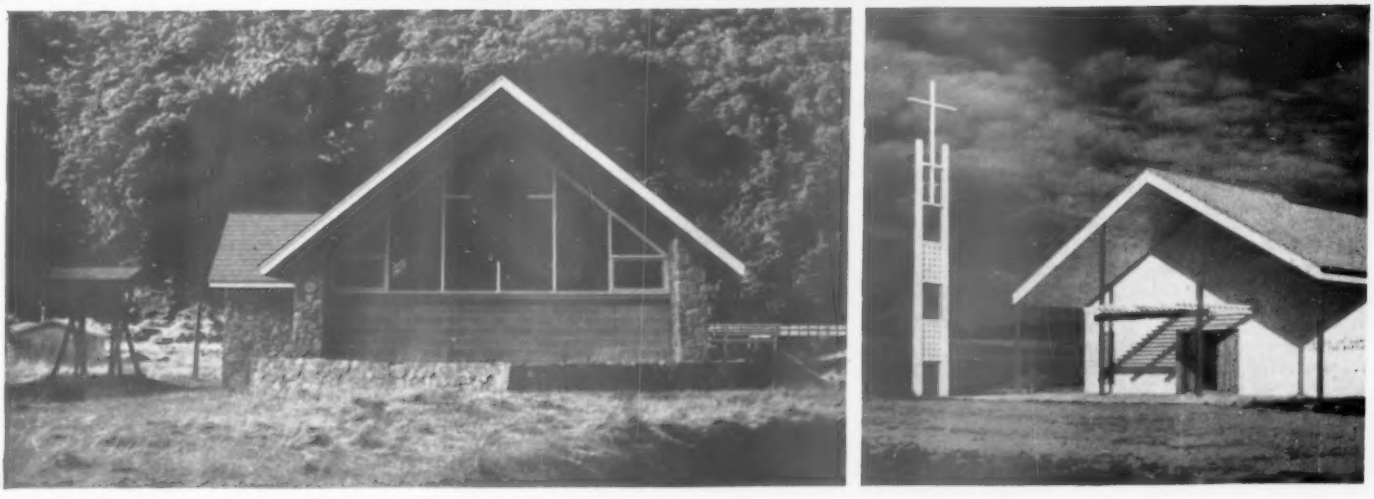
Church at Invercargill (architect, E. J. McCoy), 22, dedicated to St. Therese of Lisieux, this concrete-framed church has a straightforward hall-like interior, flanked on one side by baptistery, confessionals, and side-chapels. On the other side is a grass court (to the right in photograph) at whose head is a subsidiary wing containing the sacristy and nuns' chapel.



Church at Invercargill

St. Martin's Presbyterian Church, Christchurch, New Zealand (architects, Plishke and Firth), 23. The church, which stands in a suburban area, is designed both for worship and as a social centre, and for this purpose the rear block of seating can be partitioned off from the main body of the church. The structure is composite, the free-standing exterior columns are steel, the rest of reinforced concrete; infill panels are brick; rigid steel frames carry a timber roof. The exposed frame inside the church is painted white and the brick panels a golden yellow. Exposed purlins are painted white and the boarding between them light blue.

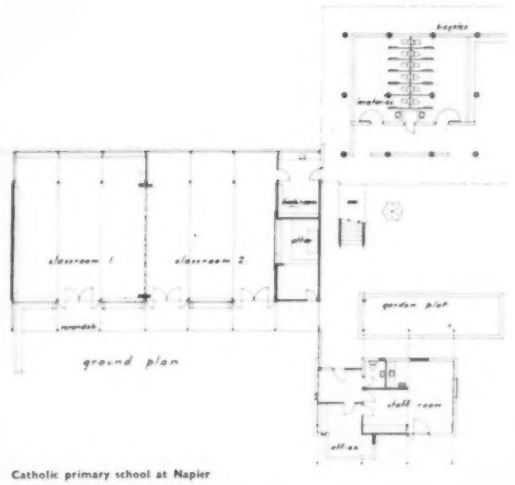

22, 23


24, 25

Chapel, Arthur's Pass, Southern Alps (architect, Paul Pascoe), 24. The design of this interdenominational chapel embodies a triple influence, the mountain hut (tent-like in form), the Maori meeting house (c.f. entrance and main porch) and an alpine chapel. Walls are a reinforced concrete core faced with alpine boulders and concrete blocks. The font is formed of three children's skis, crossed to hold the wood bowl.

Church, Alexandra, Central Otago (architect, E. J. McCoy), 25. A Roman Catholic church seating 350. The structure is of steel columns and portal frames; the side walls are of concrete masonry with coloured glass squares 8 in. x 8 in. set into block courses and the end walls of reinforced concrete. A 12-in skylight strip runs along the ridge of the roof above the nave to a larger skylight over the altar.

26



Catholic primary school at Napier

27

Prototype School, Napier (architects, NZ Ministry of Works), 27, a 'cluster' layout, adaptable to differing sites and to expanding communities, composed of a number of independent blocks, each serving a related group of teaching functions—the illustration shows the Assembly-Hall/Administrative block. Other blocks house, e.g. library, arts and academic teaching, or craft-rooms and laboratories, and the number of blocks can be increased as the number of pupils increases and the curriculum grows in complexity.

School, Napier (architects, John Scott and Hammond Hastings), 26. This Catholic primary girls' school was built on a clear flat 2 acre site to accommodate 200 pupils, with facilities for 400 when extra classrooms are built. The plan is based on the open corridor or verandah system; three separate buildings are grouped to form an open court; the two elevated classrooms cover sheltered play areas. Screen walls of concrete block wander and infill between columns. Roofs are of scissor type, self-supporting timber trusses.

Memorial Hall, Napier (architects, Natusch and Sons), 28, a civic hall and beach pavilion, incorporating a war memorial in the form of a roll of honour inscribed on granite slabs around a pool with fountain and flame of remembrance (this lies behind the right-hand end of the curving tea-terrace, and flanks the entrance to the hall). The screen-wall of the terrace has load-bearing wooden mullions, concealing the counterweights of the windows, and the hall has an exposed reinforced-concrete frame, with pre-stressed roof-beams.

28

29

Parnell Baths, Judges Bay, Auckland (architect, T. K. Donner), 29. Part of a comprehensive plan of redevelopment by the City Council; it is bounded on the eastern and southern sides by a cliff which shelters it from the prevailing winds. The main building is a two-storeyed reinforced concrete structure providing facilities for 3,000 people. Dual access is by pedestrian ramps on the east and west sides reached by a 6 ft. 6 in. wide cantilevered accessway which starts from a common point of entry on the north. The murals, executed in opaque glass chips set in white cement on asbestos cement panels, are by James Turkington, and are designed to harmonize with the painted floor of the pool.

29

30

31

32

Hotel, Southern Alps (architects, Hall and Mackenzie), 30, 31. In 1957 the mountain hotel known as the Hermitage was destroyed by fire. It was necessary to rebuild quickly and in spite of the difficult and remote terrain and the exceptional rainfall (260 inches during the period of the contract), the building was completed within 26 weeks. The construction is damp-proofed double concrete slabs for the ground floors, timber framed walls and roofs; exterior sheathing is of oiled sawn cedar weatherboards; interior, Gibraltar board and fibrous plaster. Stone walls and fireplaces are random coursed split glacial moraine boulders. There is an oil fired low pressure hot water heating system.

Air Terminal, Christchurch (architect, Paul Pascoe), 32. The photograph shows the concourse of the passenger block, looking toward the airside apron from above the baggage-checking and ticketing area.

BUILDING INDUSTRIES

The following articles, each contributed by an architect resident in the Dominion concerned, describe the building industries of the four Dominions covered by this issue, making special reference to the export opportunities offered to British manufacturers. The series of articles is summed up at the end, and their implications discussed, by a British economist, Dr. Marian Bowley, Reader in Political Economy in the University of London.

CANADA

Canada is likely to provide a large and ever-increasing market for building materials for several decades to come. During the ten years ending in 1957, the construction industry nearly doubled its volume of production. In the second half of that period, the average annual expenditure on construction was over $4,000 millions. During the last year there has been a falter in the rate of galloping expansion, but no one doubts that the long-term view is one of continuous and rapid growth.

The Royal Commission on Canada's Economic Prospects has forecast a total population increase from 15½ millions in 1955 to 26½ millions in 1980. Canada's birth rate is now the highest of any industrial country in the world. The average family unit numbers four persons. The number of children in elementary schools will soon be between two and three times the population of these schools in 1939. Enrolment in secondary schools will soon be between three and four times, and the university enrolment will be between four and five times, the figures for 1939. These children ensure the projection of the present market into the future on an increasing scale.

The long-term outlook in the Canadian constructional industry is, therefore, very favourable. Whether British manufacturers are able to supply a larger share of Canada's imported building materials will depend primarily upon an open-minded appraisal of the ways of doing business in Canada. Canadian manufacturers will themselves undoubtedly meet a large part of the demand. American manufacturers already supply about 90 per cent of Canada's total imports of this kind and they possess obvious advantages as compared with other countries which enter into competition with them. There is, therefore, no great chance of success for British manufacturers if they regard exports to Canada as a matter of simply getting rid of more of the things they happen to manufacture in England. Canada is a very different place, and practically every assessment of North America made by a person who has not stayed there for at least several months is completely wide of the mark. To the visitor from Britain the differences are particularly difficult to identify because they are often concealed under the cloak of similarities in language, racial origin, form of government and social organization.

In Canada it is unlikely that you would do business with anyone without being on Christian name terms. This air of informality has a counter-part in the general flexibility which characterizes most commercial and professional relationships. Many of the rules and procedures which are accepted so readily in England that few people notice their existence, do not occur at all in Canadian business life, with the result that the newcomer can easily confuse his scale of values. But in the long run it is action which counts. Although there are very strong conservative streaks (and you must discover those which affect your own particular activities), precedent plays no great part in Canadian life.

Canada is also a lot of different places. Eastwards of Ottawa it is important to use the French language, and it is probably of equal importance not to use the language of France. A Parisian was one of the most lonely persons encountered on a recent visit to Quebec. Toronto and Ontario are probably the most American parts of Canada, although they will seem to be very British when approached for the first time by way of the United States. From Toronto, it is over a thousand miles of wilderness before the lights of Winnipeg appear and you will cover almost 1,500 additional miles before reaching Vancouver. Here, and in Victoria on Vancouver Island, the atmosphere is subtly more British than that in Britain, although the closest geographical link is with Seattle, just over the border to the south.

The very great barrier of distance is no doubt one reason why the Delegation of the Dollar Exports Council, which visited Canada last year in order to assess the prospects of increasing UK exports of building materials, confined its tour to Ottawa, Toronto and Montreal. The implication must be accepted that exports to points further west are not feasible on any substantial scale at the present time. The report of the delegation is of considerable value and extensive reference has been made to it in compiling these notes.

In the construction industry itself, there are many aspects which are quite different from British practice. There is a National Building Code (1953), which is a set of minimum regulations as to the safety of buildings with reference to public health, fire protection and structural stability. It is an advisory document only, and has been adopted in only limited areas. This code is very close to American codes, but American codes, as such, are not used in Canada. British standards are not used at all, either directly or indirectly. There is a list of 'Acceptable building materials, systems and equipment' specified by the Central Mortgage and Housing Corporation which is a Federal body, set up to underwrite the mortgage investments of lending institutions for the construction of new housing. In practice, this list is often used as a guide by local building inspectors so far as it is applicable. It is clearly of importance to establish the acceptability of a particular product by the different levels of government which may be involved: Federal, Provincial or municipal, with most emphasis on the latter since the municipalities have full power to regulate building in their own localities.

Delivery schedules are of vital importance in a country where speed of construction surprises every visitor. Pre-planning of site operations is necessitated by high labour costs and everything is arranged to get each tradesman on and off the site in the shortest possible

[continued on page 219

continued from page 218]

time. It is not unknown for a builder to complete a development of 500 houses in three months. Construction must be pushed ahead during the limited building season and it must also be remembered that transport by water ceases throughout the Great Lakes during the winter freeze-up. Adequate stock-holding in Canada of all standard items is an essential in providing the service on which customers rely. In some cases the problem has been met by setting up local manufacturing plants for standard items, importing only components and custom-built items.

Many materials and components manufactured in Britain have been developed as the result of shortages. Although these alternatives often have advantages above those possessed by the original, they are likely to be doubtful starters in a country where everything is freely available. Timber is an obvious example. Steel is plentiful, so there is little reinforced concrete construction. The price of steel has dropped about 25 per cent in the last two years and delivery of the frame of a large building can be expected in about six weeks from the date of order. In August, 1957, a tender for steel in a bridge was accepted at $430 per ton. In July, 1958, a comparable contract was let at $230 per ton for supply, fabrication, erection and painting of steel.

In domestic building, there is very rarely a damp-proof course—standard wall construction consists of 4 in. brickwork lined with 4 in. concrete blocks. Aluminium foil is then held vertically to the blocks by means of wood lathes to which is nailed plasterboard finished with a skim coat. There is invariably a large basement, which is left unfinished, and every owner of a new house exercises his skill in completing this to his own do-it-yourself satisfaction. There are still many areas in which the frontier spirit remains, and a man is expected to build his own house. The masonry, or fire-resisting, construction described above is required in only limited areas and in most places framed timber construction is acceptable. Clay or concrete roofing tiles and slates are practically unknown; bituminous felt tiles are universal, even on the most expensive houses. Additional items of equipment not normally met with in the United Kingdom are involved in the spring ritual of removing the storm casements and replacing these with the fly screens. These examples illustrate the point that building in Canada can be quite radically different from British practice. You can export a Jaguar to North America and it will function well, in spite of a general speed limit of 55 m.p.h.; but a ship-load of well designed smokeless grates would be a highly speculative venture.

The following notes, under a few simple headings, indicate products which are already being supplied by UK firms in Ontario and suggest other products which might be the subject of investigation for export trade:

Steel and steel products

UK firms are supplying: Steel partitions and shelving. Scaffold fittings, trestles, trench struts and shores. Steel windows and double glazing units. Steel pallets, racking and flooring. Slotted angle bars and accessories. Curtain walling.

Present information suggests that this market is very competitive.

Further opportunities appear to be limited to specialist items such as: an adjustable steel column for use in house basements to support the ground floor; joist hangers and bridging; high tensile bolts; steel stringers for basement steps; pre-fabricated stairs; high tensile wire for pre-stressed concrete.

Hardware

UK firms are supplying some hardware, but exports in bolts, screws, floor hinges, double acting hinges, tubular locks and friction hinges might be increased. American lock sets are used exclusively.

Bricks, tiles, etc.

Already Britain exports: ceramic tiles; sewer pipes; porcelain and vitreous enamel tiles; cements; quarry tiles.

Expansion of trade might occur in: High quality bricks (to Canadian sizes); glazed hollow partition blocks; sanitary ware: on the West coast Japan is making a strong bid for the market.

Electrical products

Certain specialist fittings are now being supplied, but opportunities are thought to exist for: cheap, well designed fixtures and fittings; mercury vapour lighting equipment; steel conduit and electric cable; air circuit breakers; elevators (in a limited field against strong US competition); air conditioning equipment—also against strong competition; compressors.

Metal products

UK firms or their subsidiaries now supply architectural metal-work, pipe fittings, bends and aluminium window frames and sashes. There may well be a market for metal doors, kitchen cabinets, aluminium wall cladding and tiles, and office partitions.

Plastic products

At present business is being done in plastic and rubber floorings and tiles, and in plastic pipe. Export of these products might be increased and interest has been expressed in poured plastic flooring material.

Furniture

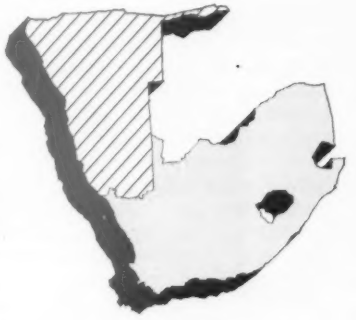
Showcases, fixtures, display fittings and store furniture are being handled by UK firms. High quality office furniture may offer further opportunities.

Miscellaneous

UK manufacturers already offer the following: folding garage doors; marine glue and roofing pitch; pre-fabricated buildings, including houses; steel rolling shutters; concrete form equipment; insulating boards; pre-fabricated bridges; mobile concrete mixers, tractors, dumpers and rollers; reinforced plastic window material; bulk cement plant, weigh batchers and concrete block machines; space heaters for temporary buildings.

There appears to be a market for insulating materials such as fibre glass, cork and foam materials. Roofing and wall cladding materials of good design might well make an appeal.

To sum up, the Canadian market is a large and growing one, but the competition of the USA in the building materials field is tough, particularly in areas such as Ontario where the general business climate has a strong American flavour. Nevertheless, the present Canadian government is sympathetic to improved trade relationships with the UK and the long-term opportunities are such as to encourage well-conducted enterprise. The importance of personal investigation, personal contacts and personal service cannot be over-estimated.



SOUTH AFRICA

Some comment on the geography and the climate of South Africa has been made in the introduction to the section dealing with South African buildings. These conditions naturally affect the material situation of architecture as much as the aesthetic.

Owing to the contrast between the elevated dry plateau and the narrow moist littoral, with the chain of the Drakensberg between the two areas, agriculture and forestry are in a precarious position throughout most of the country. The irregular distribution of rainfall in season, the intensity of precipitation and the high rate of evaporation, all combine to erode and denude the soil, lowering an already low fertility due to lack of phosphates. The rivers are thus neither navigable nor suited to large scale hydro-electric power generation. Irrigation of land is possible over restricted areas, amounting to some 8 per cent of the total, while not more than 15 per cent is capable of cultivation.

Farming is thus for the most part suited to animal husbandry, while in different parts of the country grain, fruit and vegetables provide the basis of the farming industry.

Timber is extremely scarce, only some 2 per cent of the total area being covered with forests and plantations, which are confined to the small well-watered region of Knysna in the south, and portions of the Eastern Cape, Natal and the Eastern Transvaal, along the Drakensberg foothills.

The transition from rural to urban communities, triggered off by the discovery of diamonds and gold in the 1860's, has been consistent and rapid, and has led to the urbanization and expansion of the hinterland

to an extraordinarily rapid degree, to the extent that the Witwatersrand area, with Johannesburg as its centre, is the most densely populated urban area today. This urban development has initiated the industrial and economic growth of the land, which in turn has stimulated the development of the Union's few deep-water ports.

Recent industrial developments have seen the creation of new towns to house the communities concerned. Vanderbijlpark with its steel works, Sasolberg with its oil-from-coal plant, and the new towns in the northern part of the Orange Free State centred on the new deep level gold mines, as well as those growing up about the gold mining enterprises now centering to the east of the historic Reef. The natural corollary of this urbanization has been the rise of manufacturing industries, the gross value of output of which was about five and a half times as great in 1952 as in 1939 and is still increasing.

This has contributed to a spectacular advancement in building methods. Before 1940 the building industry was still geared to the essentially craft basis of building, with a large, mostly unskilled, labour force, having a range of materials—bricks, concrete, etc.—capable of forming only the carcase of the building. For the completion, all forms of mechanical equipment, plumbing accessories, ironmongery, steel window, and most other components, including timber products, had to be imported. Some interesting facts are contained in the contemporary reports of the construction of the two Roadsaals, that in Pretoria in 1889 and that in Bloemfontein in 1890. All joinery for the former was manufactured in the workshops of the contractor's father in the Orkney Islands, shipped to Durban, railed to the Transvaal border, transported to Pretoria by ox wagon, and built into the structure. The importations for the latter are both illuminating and extensive and included ironmongery, McFarlane's castings, zinc work from England and Holland, fibrous plaster decoration, painted and clear glass, parquet flooring, marble mosaic pavements, mantelpieces, ventilators, acoustic tiles, wallpapers, Parian cement, polished granite steps, cupola lights and heating apparatus, all from England.

Since those days, both the natural resources which have been uncovered and the industrial expansion which has occurred, has made the Union self-sufficient in the majority of both the basic materials and finishings, together with the greater proportion of mechanical and electrical components required. At first the transition from rural to urban communities was epitomized in the ubiquitous corrugated iron structures. This material has proved outstandingly successful in sheltering the floating population of the early mining towns, and is still a standard roof covering of the interior provinces. In the more sophisticated urban settings it is now being challenged by locally produced materials like asbestos cement, clay and concrete tiles and slates, as well as imported natural asphalte and asphalte sheeting.

Bricks have from the earliest times constituted a basic material, and to a limited extent natural stone has been exploited. For many years buildings were finished with plaster and paint or colour wash, but local climatic conditions caused rapid deterioration of such surfaces, and to reduce maintenance, unsightliness and to increase durability, other solutions have been sought. While much domestic work still exploits the cheaper finishes, large structures utilize mainly face bricks, precast terrazzo or concrete facing slabs or reconstructed stone. Natural stone, while it has played its part in important buildings, has a varied history. Many excellent granites are available at a price, and sandstone quarries have provided some good stones. But quarries have proved extremely variable, and since the demand has fluctuated so greatly, have seldom been consistently worked. Today there is scarcely a building mason to be found, and as the cost of using natural stone is so high, its exploitation is generally to be found in the form of decorative veneers. Some local marbles are used, but the better grades are usually imported.

The steel window, which achieved such popularity in the 1930's, is in general use, and this was one of the first components to be fabricated locally. At first imported sections were used; now a high proportion of sections are manufactured in South Africa. Much of the local manufacture of building components was undertaken in the first place by subsidiaries of well established British and European organizations. Not only did they provide a locally produced article at a competitive cost but they stimulated the establishment of locally sponsored manufacturing organizations. One interesting development is in the manufacture of lifts by a subsidiary of an important principal in the United States of America. The South African built article is now being exported in world markets.

An important branch of the manufacturing industry making hard and soft boards is also exporting on a large scale. Until comparatively recently all plumbing was imported. Today a large proportion, including vitreous ware, is locally made and is competitive in both quality and price.

South Africa has not been well endowed with natural timber. The forests that existed and which produced the famous Cape Yellow wood and Stinkwood have been denuded — what remains of the Stinkwood production is found in limited quantity in special furniture. Practically all timber used in building and joinery has to be imported, most of the hardwoods coming from Central Africa and softwoods from Scandinavia and the United States. The timber industry is, however, turning its attention to the production of locally grown structural timber in which the 'patula' and 'caribea' pines are playing a major role. These plantations mature in from 35 to 40 years, giving a characteristically open grained wood which, with proper care in growing and conversion, is proving eminently suitable for structural purposes. It is anticipated that within a period of some ten years or so, the local industry will be able to supply all structural requirements. As a result, much attention is being focused on the development of timber framed buildings for domestic and similar purposes.

The local manufacture of steel has progressed to the stage where export has begun, and in rolled sections, plates and sheets, local requirements can be met. Non-ferrous metals are for the most part still imported. Recent developments in plastics have stimulated local industry, and much of this material now finds its way into the fabric and finishes of buildings. The advent of the window-wall and other proprietary forms of wall cladding, while drawing on overseas experience, has resulted in the further establishment of local factories. Sheet glass is manufactured in the Union, but special glass and plate glass is imported, while in ceramic tiles and fittings local production can meet most demands.

Both the National Building Research Institute of the Council of Scientific and Industrial Research and the South African Bureau of Standards have recently contributed important research and investigation to the standards of building and performance of materials. The former has carried out basic research on minimum standards pertaining to dwellings, in all aspects including construction. It has realized much of its work in the development of townships for the urban Bantu population, in which a great deal of money and effort has and continues to be expended. The township has not only benefited from the work of the NBRI in housing, but in schools, clinics and the layout as well. Much work has been done on primary and secondary schools for the white population, and basic research is now proceeding on hospitals. The SABS has produced a large number of specifications pertaining to building materials and where such specifications have not yet been drawn it is customary to utilize those of the British Standards Specification. Moreover the SABS has produced a number of Model Building Regulations and Codes of Practice which are gradually being assimilated into by-laws promulgated by local authorities.

It will be seen from this brief review that the position regarding the supply of building components has undergone a vast change since the 1930's, and with the exception of recently introduced special and patented components and special items including hardware and electrical, the Union is rapidly becoming self-sufficient. On the other hand the mechanization of the building industry is still embryonic and an economic balance in favour of increased mechanization in general has still to occur. There are, however, signs that the transition is taking place, particularly in relation to large scale contracting organizations, and the trend is being encouraged by the mechanistic façades and aesthetic experiments which recent developments in America and Europe have presented. Traditionally and for economic reasons the bulk of large structures have been erected with reinforced concrete frames. There are few cases where structural steel has been used, other than for roof construction, and there is little evidence to show that the position is likely to alter much in the future. It is in the cladding and finishing of such frames that the more spectacular variations are likely to occur, with due consideration to performance, durability, maintenance, and the varied climatic conditions to be met with in the Union.

AUSTRALIA

At each of the four corners of one intersection in the business district of Melbourne deep holes are being excavated behind builders' hoardings. To the west along Bourke Street a racket of rubble and wreckers' dust, steel skeletons and rising curtain walls suggests a city bravely recovering after some major disaster. But there has been no major disaster (none can be found in Australia's brief history); there has been only a comparatively stagnant and dispiriting phase of building development. The stagnation was of course the result of the second world war, with its subsequent shortages and controls which directed 80 per cent of the building industry's resources into housing. These were drab years spent making cottages with a limited range of home-grown building materials. About 1954 industrial and commercial building revived and in 1956 there came a boom which threw the industry into the greatest activity since it made the grotesque stucco palaces of the late nineteenth century. Building expenditure for the year 1956–57 amounted to £361,000,000—more than a quarter of the total investments in Australia for that year. In 1957–58 buildings costing more than £100,000,000 were completed in Sydney alone. Since then the boom has become less exciting and more of a habit. The industry is now merely fully employed and expecting to participate with reasonable profit in the unlimited future which Australia nowadays pictures for herself (all going well in Asia).

The new confidence has concrete foundations in big public works, the most impressive of which is the enormous project in the Snowy Mountains where coastal rivers are being diverted through the range back into the dry interior. And it is ornamented with non-utilitarian buildings, like Sydney's opera house and Melbourne's music bowl, which would have been politically impossible a few years ago. With the lifting of restrictions on 'non-essential' buildings, the construction of private houses meanwhile has dropped from the record 83,000 built in 1951 to an estimated 70,000 this year. Social workers and Opposition politicians warn with good reason of an impending calamitous return of the housing shortage, even though the number of separate houses under construction per head of population must still be close to a world record. The shortage cannot be estimated very scientifically. It is measured not by the number of homeless but by the number wanting more comfortable homes and the main obstacle is not a shortage of builders, labour or materials, nor of money in the weekly pay envelope. It is a shortage of capital, a chronic condition of Australia. There seems no limit to the dribs of money available for non-durable goods, but continually the flow of money for building investment strikes blockages. However, the Government, the insurance companies and the banks do contribute their money to the building industry in another way: by commissioning some of the most elaborate of the new curtain-walled office blocks which are transforming the recently-moribund central areas of the capital cities.

The decline of housing to little more than half the total output of the building industry has re-animated the architectural profession which was never greatly concerned with the cottages. It is not unusual for a man to be operating a satisfying little private practice five years or so after graduation. The Royal Australian Institute of Architects now has 2,600 members. The drift from housing has also caused a reshuffling in the builders' ranks. The once-crowded field of 'little' builders—the family teams and the random spec. builders—is thinning out. The only way to make a success of housing speculation now appears to be the big way: a hundred 'executive's villas' at a time, a 'package deal' with finance arranged for the furniture as well, a multi-coloured marquee, and the Minister for Housing flown to the site by helicopter to launch the parade.

In bread-and-butter building materials Australia has always been self-sufficient if not opulent. Today the production of bricks, steel, cement, terra-cotta and hardwood is steadily if unevenly on the rise, keeping pace with the rapidly growing population. The most obvious deficiency of the land is in softwoods. For all practical purposes Australia has no native softwood. The ubiquitous eucalyptus grows in hundreds of regional varieties of texture and colour, from the deep rust red of the western jarrah to the sun-bleached northern silver ash—an albino wood as light as an ocean beach. Some, like jarrah, is practically impervious to dampness and rot. Much of this is exported as railway sleepers. Other varieties, like the straight yellow mountain ash which climbs to 300 feet in the south-eastern highlands, do almost any indoor job beautifully and well: framing, flooring or furniture. All of this wood is hard, and unstable while carrying any moisture, requiring diligent kiln-drying, which was early developed in Australia. It supplies about 80 per cent of the timber requirements of the building industry. The remainder is made up of imports, mostly softwood. More than half of this is Douglas Fir, or 'Oregon,' from the USA and Canada. Some is 'Baltic'—Scandinavian pine ready-milled into flooring and weatherboards, and some is Radiata Pine from New Zealand's plantations. About one-quarter of the timber imports, to the value of some £3,000,000 annually, is spent on figured timbers from Borneo, Malaya, New Guinea.

While the local bread has been wholesome, Australia developed a habit during a century and a half before 1950 of reaching abroad for the marmalade or peanut butter. While she made her own roof tiles and floor tiles, she imported the decorative tiles for the walls from the UK, Italy or Japan. While she makes now two-thirds of her sheet-glass requirements she still imports all her plate glass, mostly from England. No plate glass is made locally because nobody has yet considered that the local demand—two to three million pounds-worth yearly—justifies the expense and trouble of setting up the machinery. In view of the international entanglements of the glass industry it just seems easier to buy the stuff ready made. This typifies the Australian attitude before the Second World War, but since then a new concept of Australia as an industrial power and a factory for Asia has grown. Now there are proportionately more factory workers in Australia than in America and the ever-increasing load of refrigerators, power lawn-mowers, television sets, room-conditioners, and labour-saving devices which burden the working man is almost entirely made in Australia. The economy still rides on the sheep's back but exports of industrial goods, including iron and steel products, aircraft, vehicles and electrical equipment are rising continuously. Manufactured goods now amount to more than one fourth of the export trade. There is even the faintest hint of an architectural device emanating from Australia with these products. The adjustable glass-louvre window—which is one of the country's three contributions to domestic technology along with the development of fibrous-plaster sheeting and stainless steel sinks—is being exported in sizable quantities from Queensland. Mainly these airy windows go to Asia, but others to the value of £30,000 annually are imported by the USA and double this quantity is bought by Great Britain. Galvanized iron sheeting worth some six million pounds is exported each year to New Zealand and Asia.

All the time the Australian content of building is rising. About three-fourths of all hardware, light fittings and sanitary ware used are Australian-made. The remaining fourth is welcomed for variety rather than to make up a shortage. Most of the gas and electrical stoves and virtually all refrigerators and air conditioners are made in Australia, and quantities are exported. About 97 per cent of the 140,000 tons of structural steel consumed yearly by the building industry is locally produced. The remainder is mostly giant sections which are not rolled because the manufacturers consider the demand is limited. A few prefabricated aluminium buildings are imported and about the same quantity of steel prefabs is exported. Plastics of all kinds are made and used with an enthusiasm which suggests there might be a special appeal to Australians in the smooth, cheap, intricate precision of the moulded product. On the other hand, no wallpaper is printed in Australia. The little that is used comes from England or Japan.

Practically all the millions of gallons of paint used on new buildings and in gingering up old buildings with 'contemporary' fashion hues are produced in Australia. The sources of the paint industry, with its £30,000,000 annual output, are significant. Nearly all the companies which desperately compete in

this field are dutiful sons of absent parent companies in Britain. The term 'Aust.' in parenthesis, as in Joe Smith & Co. (Aust.) Pty. Ltd., is familiar to Australians, a constant reminder that most of the industrial boom is founded on initiative and ideas from abroad and as much as twenty-five per cent of it on outside capital. There is no real resentment of this. Australians know they need outside money. They invite it and welcome it. All the same, they are impatient to be independent of it.

A company from overseas, however established and distinguished it is elsewhere, needs more than 'Aust.' in its name to be ensured of success. Manufactured products usually need some adaptation to the Australian market. Most success stories of the industrial race surround those products which have somehow subtly flattered the new Australian pride in her own progress. The outstandingly popular car, for instance, is not the ponderously chromed automatic V-eights of the Ford Motor Co. of Aust. Pty. Ltd. or Chrysler Aust. Ltd., nor the thrifty four cylinders of the British Motor Corp. (Aust.) Pty. Ltd., which somehow look apologetic on a bush road. The car which has practically cornered the market with about 48 per cent of total car sales is the only car claiming to be 'designed especially for Australian conditions': the Holden, by General Motors-Holden's Ltd. This medium-sized six is not only as fast and tough as an Australian Rules footballer, it also has a cynical appreciation of the nuances of Australian taste in every line from its two-tone plastic upholstery to its moderate chromium tail-fins: not too big, not too small.

Not every European or American has the ability to convince the Australian public that his product will make life more delightful. The waste-paper baskets of architects and builders are seldom entirely empty of direct-mail advertising pamphlets from England and the Continent. Some of these announce excellent and proved products with a potential future in Australia, yet sometimes they seem inapplicable because the presentation is out of touch with realities as well as the psychology of the time and place. The British bathroom, to give a minor example, is a different sort of room from the three-compartment Australian infernal machine for bathing, and sanitary or ceramic ware designed for one sometimes looks out of place in the other. The Australian buyer appears unmoved by a nice sophistication in a finely-drawn pattern on a tile; at the same time he or she is well aware of the potentialities of efficiently designed built-in fittings and usually can be relied upon to fall for any bold, vivid colour contrast or anything labelled 'pressomatic.'

It is not easy but by no means impossible to define Australian tastes and demands in every field. Usually they lie somewhere along the line between the English and the American, never quite coinciding with either. Any product which can catch these subtleties and present itself to the Australian public with a convincing promise of brighter living—anything in the way of tasty marmalade on buildings—can feel assured of a wide, secure and rising market.

NEW ZEALAND

Geology, topography, climate and earthquakes all distinctively affect building in New Zealand. Geologically, New Zealand is very young. The land is so recently raised above the sea that natural erosion is in its earliest stages. Little durable stone is exposed and foundations are commonly poor; right down to a value of a quarter of a ton per square foot in areas of recent volcanic deposition. Topographically, much of the country is very steep. Settlements begun on flat lands a hundred years ago have long since climbed the sides of flanking hills, providing excellent views but conditioning much of the planning.

Within these limits, the climate varies widely from the semi-tropical humid north, through windy wastelands, to snowlands of the Southern Alps and the parched plains of central Otago, but generally speaking the populated areas are rich and green. The very highly actinic quality of the atmosphere allows intense solar radiation, posing acute problems in curtain walls, paints, bituminous roofs, exposed woodwork and the like. The combination of high winds and heavy rain demands great care in weathering of joints and permeable materials. Consistent winds expose weaknesses in window frames and wall cladding. The clear atmosphere allows considerable temperature differences between day and night, inducing condensation problems.

All New Zealand is subject to earthquakes; many heavily populated districts are built over known faults. Despite fairly frequent destructive earthquakes, it was not until some twenty years ago that a standard code of by-laws was established covering the earthquake resistance of buildings. Until then construction was largely rule of thumb: timber-framed buildings were known to be fairly safe; reinforced concrete was known to be safer than masonry. Nonetheless after the memory of earthquakes had weakened in any locality, even such simple rules were disregarded.

The first code, which is still in force, laid down the horizontal loads to be carried by various elements in buildings. The code was required urgently, giving no time for research. Japanese and American codes were studied and amended and the New Zealand code was made more rigorous for good measure. It is now considered that the code is unsuitable in many respects. It does not control the separation of buildings, so that buildings having differing natural frequencies can damage or destroy each other. It takes little account of the effects of flexure or of the reduced stresses in flexible buildings. It does not lay down requirements against vertical ground movements. It takes no account of the varying probabilities of shock in different parts of the country. It is to be expected that a new code will be produced in the next few years.

The effect of the present code was, initially, to encourage the use of timber, steel or reinforced concrete framed buildings and to render such frames very heavy and clumsy. Engineers are now thinking more deeply into the problems and are solving them increasingly in terms of the 'shear wall': concentrating seismic loads in certain walls and freeing the remaining frame to take normal loads only. In general, this is reacting in the same direction as international aesthetic trends—towards the heavy core and the light perimeter. In certain instances the conception of the frame is abandoned completely and all loads are taken in box-shaped structural elements.

Brickwork has proved quite unsuitable unless reinforced and tied back to other structure capable not only of taking all seismic load, but capable also of being sufficiently rigid to avoid cracking of the vulnerable brick wall. Probably as a result of these factors, bricks are not extensively manufactured and are very expensive. Such small quantities of stone as are quarried are mostly used in the form of small decorative areas of rubble walling. Stone as an ashlar facing material is uncommon, expensive and generally imported.

Timber is New Zealand's maid-of-all-work in building construction. In the form of a light frame, it is the basis of most houses, schools, community centres, small churches, and even small hospitals; and its importance is steadily increasing in engineering. In almost every building the partitions and suspended ceilings are of timber; in many concrete or steel buildings, the roofs, and floors are still of timber. Tradition has rendered the techniques of timber use so automatic that the phrase 'according to the best trade practice' could almost completely specify the construction of a normal house.

As the Europeans found it, New Zealand was almost completely covered in forest. For many years trees were the enemy of the settler. The prodigal use of timber, which was thus encouraged, extended on into the period when supplies were dwindling. For many years Kauri has been almost unobtainable; now Totara is nearly exhausted and Rimu, Matai and Kahikatea are becoming scarce. All these timbers are softwoods having a singularly wide range of virtues—strength, ease of working, good appearance, freedom from defects, resistance to weather and decay.

In this century enormous pine forests have been planted and pine is gradually gaining acceptance as a building timber. As at present milled, it lacks many of the virtues of the native woods, but it is perforce employed more and more for framing or for painted interior dressed timber. To render pine

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acceptable to an industry accustomed to lavish supplies of native heartwoods, timber preservation techniques have been developed further and used more generally than elsewhere. Traditionally, New Zealand imports Mahoganies for veneers, Douglas Fir (known as Oregon) for heavy structural members, redwood and cedar for very high quality external joinery.

In-situ concrete is the other commonplace building material. Widely used before, its employment was boosted by the earthquake code. The standard of concrete-making is high—reputedly higher than in England—but precast and prestressed precast work has been slow to gain favour. It has been felt that structural continuity—necessary for earthquake resistance—is difficult to obtain with them. The growth of use of these elements is now, however, rapid, because in-situ post-tensioning techniques are solving problems of continuity, and prestressed work is competitive in cost and it absorbs a smaller quantity of imported material. The whole basis of the use of concrete may thus be changed within a few years.

Although New Zealand is a land of corrugated iron roofs, concrete roofing tiles are common. Their production seems to have swamped that of clay tiles and they are invariably of the Marseilles pattern. Curiously enough, in a country where precast concrete is uncommon, excellent concrete shower trays, drainpipes and washing-tubs have long been available, all with a very high finish. Concrete blocks are also fairly common, although their use in the form of unreinforced walls has been limited in the same way as bricks. They are, however, much more readily used in conjunction with reinforcement and in some parts of the country their use is so common as to constitute a local vernacular. (This reflects the fact that, although the country is so small, its topography is such that transport is very expensive. Most materials are produced and used everywhere. Those produced only in certain areas are equally limited in their use.)

Traditionally, the bulk of the area of external walls in fire-resistant buildings has been in concrete, covered in cement plaster. It has been no more successful than would be expected. Although New Zealand's atmosphere is clear, staining does occur. Coloured plasters have been extensively used without great success. Brick and stone facings have been uncommon on account of cost. Curtain walling offers one solution, and others which are increasingly used are faience, glazed tiles, mosaic tiles, terrazzo and precast or in-situ concrete with a finished face. But basically, even today, in the economical building there is no substitute for plaster.

There are thriving industries manufacturing gypsum plasterboard, fibrous plaster, asbestos cement, hardboard and softboard, other linings of all sorts, insulating materials and acoustic materials. Practically all paint is locally manufactured, as are limited ranges of light fittings, electrical equipment, sanitary ware and plumbing fittings. The manufacture of articles in stainless steel sheet has been widely developed, to a point where it is used far more freely than in England. Metal windows are in common use and those imported can so far compete economically with the products of New Zealand factories.

The country has no developed resources of iron, but the possibility is being investigated of establishing an iron and steel industry based on local ironsands. All steel is imported, mainly from Britain and Australia: this tends to raise the relative cost of steel-framed buildings, but nevertheless the steel portal frame is the norm for wide-span roofs.

New Zealand's trade difficulties in maintaining a balance of payments lead to recurrent periods of drastic import restrictions, and redoubled efforts to exploit products of local origin or manufacture. A side result is the increasing manufacture under licence of British and U.S. designed articles. For political or economic reasons there are occasional periods of relative respite, leading to stockpiling of imported goods and thus softening for a time the full impact of the next round of restrictions. On grounds of ready availability as well as economy the advantage remains with depending on locally-produced components. Nevertheless many building needs can be met only by the use of overseas products, by reason of the impracticability of local manufacture, or to permit techniques of proven advantage, or else to avoid uneconomic use of costly local labour. Instances are metal sheets in all forms, specialized equipment of buildings, and site mechanization plant.

It has been estimated that in normal conditions imported goods represent about 12 per cent of national building costs. Were local products to be substituted wherever possible, the imported content might be reduced to about 5 per cent. Imports are the sole source for steel and all other metals, for bitumen and many mechanical fittings, for lifts, boilers, radiators and major electrical gear, as well as for such everyday essentials as window glass, plumbing pipes, door locks, resilient floor coverings and corrugated metal roofing sheets. The country is partially dependent on imports to maintain adequate supplies of many items also made in New Zealand, such as baths, metal windows, builders' hardware, sanitary fittings, mechanical equipment and appliances, roofing materials, putties and mastics.

In a rapidly expanding population (expectations are for a 35 per cent increase to 3,000,000 people by 1975), the building industry provides, directly and indirectly, the largest source of employment apart from the primary industries on the land. It is, however, less of an industry and more of a trade than in Europe or North America, although the same trend towards industrialization is evident in New Zealand as elsewhere. Mechanization is moderate, labour and materials costs are both high; so speed of construction is modest and building costs are high. The one way in which mechanization has really taken charge is in the use of ready-mixed concrete which has become commonplace in jobs of all sizes. The standard of workmanship is about as variable as in England but there are today not very many demands for refinement and craftsmanship—there is always so much more to be built than there are men to design, organize and build it.

SOME ECONOMIC ASPECTS OF BUILDING IN THE DOMINIONS

by Marian Bowley

The four preceding articles may leave the reader somewhat bewildered by the complexity of the differences between building practice in the four Dominions. They illustrate indeed the way in which building reflects diversity in social organization and cultures as well as in economic development and resources. Interesting though the issues raised by such general reflections are, it would be inappropriate to discuss them here. The object of this concluding article is less ambitious; it is intended merely to try to indicate the economic significance of some of the differences between building in the four Dominions as well as to show what similarities exist. In this way it may be possible to provide some idea of the character of the potential markets in these Dominions for the building resources of Great Britain.

One of the most marked differences between the Dominions is in the sizes of their populations. The most recent figures are as follows:

Canada (1958 est.), 17,000,000; South Africa (1951), 12,700,000; Australia (1957 est.), 9,700,000; New Zealand (1958 est.), 2,300,000.

The population of New Zealand is thus about the same as that of the county of Middlesex in 1951, while that of Australia is about the same as the counties of London, Middlesex, Essex and Surrey added together in 1951. Even the population of Canada is only about a third of that of the British Isles. Actual size of population, though important, does not of course offer more than a very rough guide to the size of the market for building resources. The extent to which population is increasing is also a factor to be taken into account, as, for instance, in Canada, for if the standard of accommodation is to be maintained, increases in population provide automatic increases in demand.

These demographic facts are among the most easily identified influences on the demand for buildings, but wealth and the extent to which the population is aggregated in towns are also significant. In general the wealthier and the more urbanized the population, the more elaborate and complex are its building requirements, and the more buildings it requires besides those for domestic purposes. The demand for public buildings of all sorts usually increases with rapidity; not

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only churches and schools, but places of entertainment, shops and government and commercial buildings are needed. Industrialization creates its own demand for buildings, frequently of types differing from those required for the ordinary process of living in towns. If increases in wealth, urbanization and industrialization all occur together, the increase in demand for building resources in general will be accelerated and, also, the demands for specialized materials and techniques of building. There can be little doubt that in Canada this type of development is proceeding rapidly and that it is significant also in Australia. In South Africa, where about five-sixths of the population is classed as non-white, the outlook is somewhat more obscure owing to the possible effects of the policy of Apartheid on building requirements. New Zealand, on the other hand, seems likely to remain a predominantly agricultural country with a rural population. In 1957, for instance, only about one-third of the value of the national product was derived from manufactures and mining, while in Australia the proportion was more than half.

Urbanization and industrialization have, however, other consequences which are particularly relevant to this article. A great variety of building materials locally available have proved suitable in the past for the erection of the small domestic and farm buildings of mainly rural populations. Indeed the possibility of using local materials has been important in facilitating the settlement of the new countries. The technical requirements of buildings needed in large towns and for industrial installations, as well as to provide for considerations of prestige, are not so easily satisfied. The types of buildings required and the materials suitable for them are much more restricted, and are therefore more uniform between countries. If they cannot be produced locally in sufficient quantities they have to be imported. Iron, steel, cement, asbestos-cement, various building boards and glass, for instance, as well as innumerable fittings and components, have all entered into international trade during the spread of urbanization and industrialization. Although the main effects of this have been most conspicuous in towns, rural areas have not been wholly unaffected. Rising standards of living, improvements in communications and transport and the gradual elimination of local characteristics, typical of modern civilization, have opened up rural markets which had previously depended on locally produced building materials. In some areas this process has been accelerated by the exhaustion of indigenous materials. It is noteworthy that all the articles on the individual Dominions draw attention to such changes.

From the point of view of producers of materials and components in this country, however, the practical significance of these developments tends to be limited by a number of factors. As the Dominions have increased in population and wealth and have become more industrialized, it has become economic, or at least commercially possible with the aid of protective tariffs, to produce many of the major modern building materials locally. South Africa used to import all her glass and plumbing requirements; now she produces her own sheet glass and a large proportion of her plumbing requirements, and these are regarded as competitive in quality and price. Similarly both Australia and Canada now produce large proportions of materials and components which used to be imported. Even New Zealand is producing rather more of her own requirements. The establishment of these local industries has in many cases been facilitated by the setting up of subsidiary companies by large producers with headquarters in this country.

Development of local production is naturally more important in the case of those materials whose transport costs are high in relation to their value, and especially so in the Dominions farthest from this country. Nevertheless it will be appreciated that the establishment of domestic industries is not always the only alternative to importing from Great Britain. New Zealand, for instance, is nearer to Australia, and both are accessible to Asia and America, while Canada, being geographically a part of the North American economy, can easily supplement her own resources from the United States.

It appears evident then that although the total market for building materials in the Dominions discussed in this survey is likely to continue to expand, so is the capacity of

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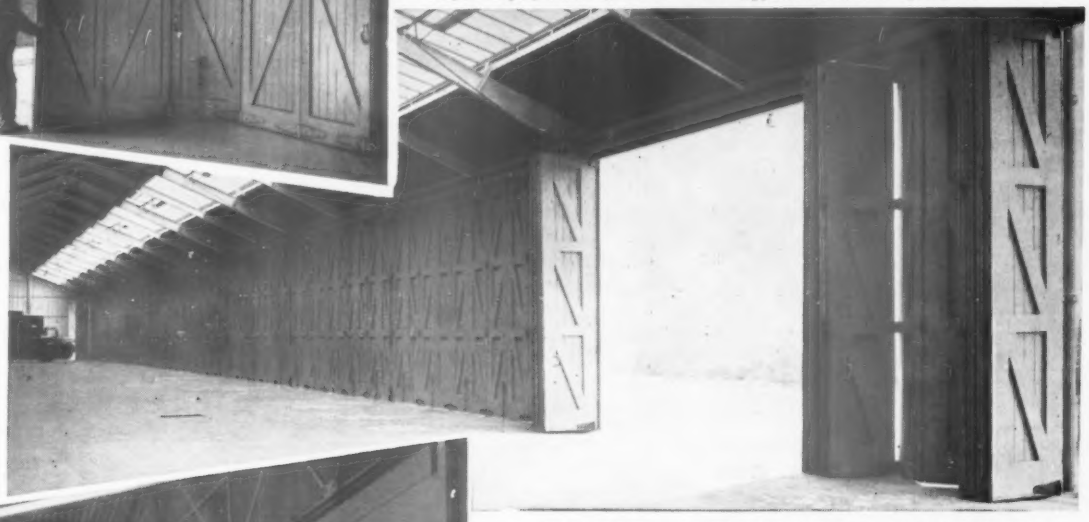

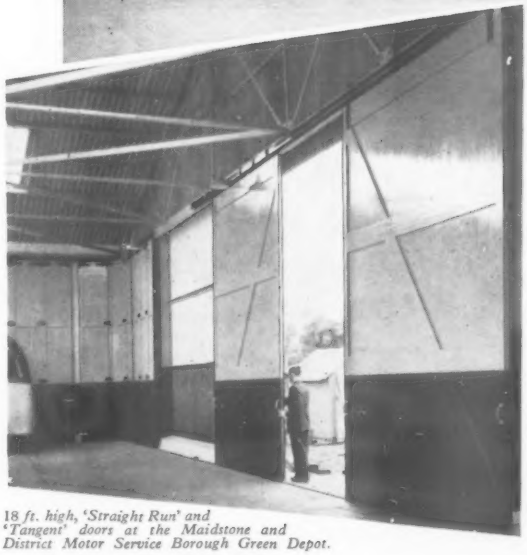

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the Dominions to supply themselves, while in any case Great Britain is not necessarily the most convenient source of supply for imports. It is, moreover, just those items which are of major importance in modern buildings which tend to be affected by these developments. Only in New Zealand is local production unlikely to develop far and growing Australian industries may well compete successfully with Great Britain.

There may well nevertheless be a future for the development of exports of building resources of a rather different type. It is evident from the articles on the individual Dominions that though they differ in many ways, they resemble each other and differ from Great Britain in several important respects. They are all in varying degrees short of capacity to produce a wide variety of highly specialized materials, components and equipment. Even Canada, which is undoubtedly the best equipped industrially, has been shown to have a potential market for a considerable number of such goods, ranging from steel components and fittings to prefabricated houses.

Again, all the Dominions are short, judged by standards of this country, of skilled labour and also, particularly the smaller ones, of technical and professional personnel. This suggests that there are openings for the export of these skills. This can take place in various ways. Building components can be designed for use by unskilled labour and complete prefabricated buildings can be developed for export. Designing, technical and supervisory staff and key skilled workmen of contracting firms with headquarters in this country can be exported for special work. Since the war interesting developments have taken place along all these lines. Some of the firms which developed prefabricated buildings for use in this country have turned their attention to export. Sometimes such ventures are controlled directly from headquarters in this country; in others subsidiary companies are established which make use of the production and experience of the parent company. In effect these companies are exporting the technical knowledge and building skills more plentiful in this country than in the Dominions, and also taking advantage of Britain's more varied engineering and building material industries. The size of the home market as well as the longer period of industrialization of Great Britain are, from this point of view, important advantages facilitating the creation of a great variety of specializations in knowledge and production capacity. These developments, it will be observed, are similar to those which took place last century in the civil and structural engineering industries.

None of these openings for trade with the Dominions, however, can be exploited solely on the basis of experience in this country. All the articles on the Dominions stress the difference in requirements of the different areas. Some of the differences are the result of local traditions and tastes, but others arise from differences in technical needs and of climate. In Canada, for instance, the building season is short, in New Zealand the earthquake risk has to be taken into account. In South Africa and New Zealand local transport problems are particularly difficult and so on. A further complication is created by the fact that building regulations differ both between the Dominions themselves and between them individually and this country. Success under such conditions must depend to a substantial extent on detailed knowledge of local conditions.

This problem of the local diversity of requirements necessarily raises the question of how far Dominion markets are worth cultivating. If the market for a particular product is small and uncertain and requirements much different to those in this country, the special adaptation of the production processes involved may not be worth while for producers with thriving markets in this country. This suggests that the prospects for a thriving export trade in building resources might be improved if there were some agreement to reduce the non-functional differences in requirements for particular materials and components. Important work is done by the Building Research Station and the British Standards Institution here in defining technical requirements and properties of materials and components for particular purposes. It might, for instance, be extended in co-operation with the Dominions to help provide a scientific basis for rationalization of requirements.

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